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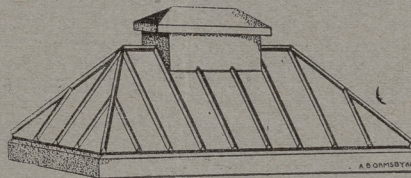
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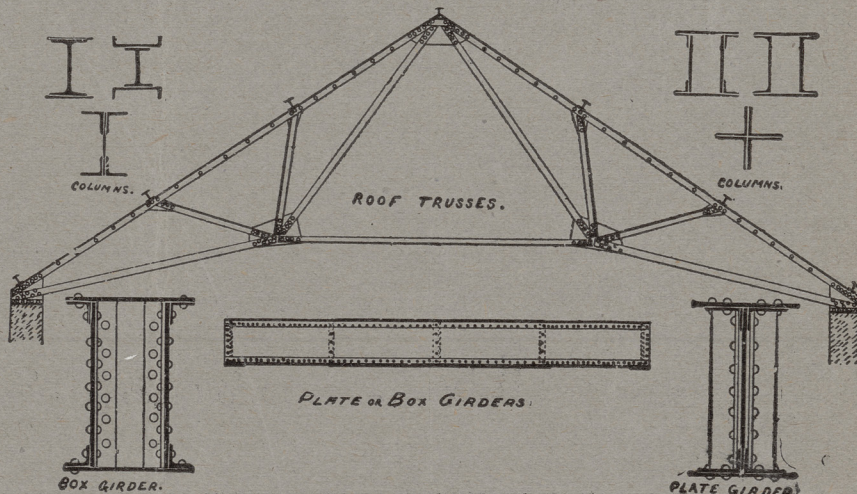
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The Canadian Architect and Builder

VOL. XVII.—No. 204.

DECEMBER, 1904.

ILLUSTRATIONS ON SHEETS.

House in Roxborough Street, Toronto—Messrs. Sproatt & Rolph, Architects.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Santa Croce, Florence—Looking East.
House in New Hampshire.

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Sir Aston Webb.

Honours bestowed on the occasion of the King's birthday, last month, included knighthood for

Mr. Aston Webb, R. A., the late President of the Royal Institute of British Architects. He makes the fifth Knight in the profession in England. There is also a Baronet.

A Skyline of Tanks.

Toronto, since the fire, has come to the conclusion that there is nothing so satisfactory for the business part of a city as a general use of sprinklers. That is agreed. But how about the tanks which crown the buildings thus equipped. The cooper's art is one of our few surviving handicrafts, and it is right we should exalt it—but abstractly. This elevation of a monstrous vat to roost on every building is grotesque; fine in its way, but not in the way in which the town aims at being fine. If we had mill design as well as mill construction the ensemble would be perfect, but we are in the grip of the Renaissance and must be Renaissance all through. Fortunately, though a Renaissance tank would tax the resources of Vignola, a Renaissance tower is easy, and, if clients require precedent for a tower on their buildings, there is one at home in the Canada Life Building. The low tower which is the making of that building has for its *raison d'être* the elevation of a water tank to supply pressure to hydraulic elevators. The Canada Life tower was carried out on a scale beyond absolute requirement,

but it suggests, on whatever scale, the architectonic solution, for, though, a sky line of tanks is absurd, a sky line of towers would be quite another thing.

Engineers for Fire Chiefs.

One more department of modern life is about to get into the hands of the engineers. The

case of the Flett-Lowndes' building in Toronto, where, after the fire which started the sprinklers was extinguished, 20,000 gallons of water were sprinkled on the goods, because the firemen could not find the valves which controlled the service, points to new conditions that have to be met. In the first place the headmen of every district must be (and in fact are) informed of the position of the valves of every automatic service in their district. But they must remember where the valves are, or have a note of it in such form that they can refresh their memory in a moment; and, as the simplest form of note and the most quickly read is a plan, there should be a plan of every automatic system in a given district filed at the district fire-station. And the station-boss should take the plans with him to every call in his own district, to guide not only himself but the chief. Secondly the firemen must be familiar with the mechanism of all such contrivances. At the Flett-Lowndes fire they appear to have wasted time in experiments from want of a clear understanding of the functions of the pipes connected with the sprinkler system. And an insurance man declares that, when h

attempted to explain a system newly installed to some members of the fire-brigade, he could not get them to understand it. So the brigade, or at any rate the bosses, have some new ideas to get hold of; which no doubt they will do by practice. But amid the fire appliances, the preventive appliances, and the construction and mechanical equipment of buildings, the chief wants a good deal of technical knowledge, and public opinion is turning in the direction of an engineering qualification for this office. Among the deductions of Mr. Edwin O. Sachs from the reports on the Baltimore fire (discussed in another column), is "The necessity of officers in charge of fire-brigades having a technical, i.e. either constructional or engineering education of a high standard."

Mr. John Belcher, in his opening **Censorship of Buildings**, address as President of the Royal Institute of British Architects, advocates the establishment of public censorship of buildings. He would have the First Commissioner of Works act as a minister of fine art with the aid of an advisory committee, and possess despotic power to decide what may and what may not be done in the treatment of public places and the spaces and buildings around public institutions, in the formation of new thoroughfares and in the question of buildings harmonizing with an existing or determined general scheme. A building act, Mr. Belcher says, can determine heights and so on, but no act of Parliament can define the subtle qualities and delicate *nuances* which make the difference between art and lack of art.

This is very true, and in England it is possible to find not only First Commissioners of cultivated taste but also an advisory committee which may be trusted to be as expert as the expert whose work is in question; so that on the whole there is a greater safety in giving authority to a combination of this sort than in giving free sway to individual indifference or extravagance or even to individual good taste; for a standing commission would be the means of maintaining what is the greatest deficiency in modern streets—unity of style. The greatest thing in a street architect is harmony. A high level of taste in one manner (we are assuming a high level) is better than a jumble of motives, even if here and there (and it would be only here and there) it touched perfection. Mr. Belcher seems to derive support from the United States, where, he says, "some such exercise of authority has been found necessary." If this means the municipal Art Commissions, they hardly go as far as Mr. Belcher proposes, but to judge from some newspaper utterances they are a success as far as they go. Their power is only one of veto, but this is a great power; for no one, whose work has to come before the Commission, wishes to run the chance of crowning his labors with a veto. He does some wholesome vetoing himself as the work progresses. This, which is the process of all good design, is thus forced upon aspirants for municipal work who, before the appointment of an independent commission might have trusted to political influence to carry them through.

Models in Staff.

Anxieties about the result of altering the east front of the Capitol at Washington have drawn from the Mr. W. S. Eames, President of the American Institute of Ar-

chitects, a suggestion that a full-size model of the proposed alteration should be erected. The cost is estimated at \$100,000, and it is thought worth while to go to this expense although the scheme of the architectural committee's advisors, Messrs. Carrère & Hastings, is presented in the form of a model and there is another scheme of which a model is also provided. The contention is that a small size model is so completely grasped by the eye that it may mislead as to the actual effect in the case of a large building or one with a limited range of distance for points of view. All architects, no doubt, meet occasionally with unpleasant surprises in their executed work, but the conditions under which the work is done have much to do with that. In the case of the Capitol the conditions—a complete model to show the design, an existing building to help the eye of the imagination in judging the effect when completed, a stereotyped style which has few surprises for any architect and can have none for the firm advising the committee—all these conditions make so much for certainty in the present case that it gives an emphasis to this public confession of architects (for Mr. Eames fills a representative place) that the only result of the high development of architecture during recent years in the United States is to make the profession tread with fear where an earlier generation went confidently on. It is not a stimulating position. Is it really so impossible to conceive the effect of a design from the usual aids—drawing, modelling to scale, helped occasionally by a full size model of a leading feature set up in place—that we must consider it necessary in work of unusual importance to resort to the study of a full size model of the whole, or at any rate of the whole front? One thing is certain—that however much the frequent use of full size models may increase perfection it is pretty sure to decrease power. To do without such aids is a struggle for the imagination, but it is exercise that makes it strong. The strain to conceive a design "in the round," the practice of visualizing it by the help of other buildings that have little in common with it but similar bulk, the consideration of detail by criticizing existing examples, the study of one's own earlier work in the light of new experience—this habit of brooding over a design, engendered by the very uncertainties it involves, is far more educative and developing than the pottering process of altering a model.

CANADIAN PAVILION AT LIEGE, BELGIUM.

When Hon. Sydney Fisher returns to the Capitol he will decide upon the purchase of a site for the Canadian pavilion which is to be erected at Liege Exposition. Liege is a great centre in Belgium and any display which Canada makes there will be brought prominently before a large consuming population. The cost of Canadian building, including the site, may run to \$45,000.

FOR THIRTY DWELLINGS.

The section of land purchased recently by Professor Goldwin Smith, on Gerrard street, east of the Don, as sites for artisans' dwellings, will be handed over to the Artizans' Dwelling Company. The land secured will provide sites for thirty dwellings.

PRACTICAL LESSONS FROM THE BALTIMORE FIRE

At last we have got a report upon the Baltimore fire which is of undoubted value, coming from a disinterested and authoritative source, the British Fire Preventive Committee. This body is publishing a quarterly journal* of which Number I. is occupied entirely by the special subject of the Baltimore fire. This utterance, which is called a Record of the Baltimore Conflagration is the work of Mr. Edwin O. Sachs, who is the chairman of the five Prevention Committee. It is a compilation from American documents and a summary of his own opinions. The remarkable thing is that out of the enormous crop of published utterances, supplemented apparently by a flood of information, opinions and theories from correspondents in the United States, he has been able to select only three reports that he considered honest. These are:—1. The report of Capt. Sewell, of the Corps of Military Engineers at Washington, which may be called the official report of the U. S. A. Government upon the catastrophe. 2. The Report of the Boston Mutual Experiment Station, called the Insurance Engineering Experiment Station, which is under the direction of Mr. Edward Atkinson, the first mover in the Field of Fire Prevention. The report is by Professor Charles Norton who is in charge of the Station and is approved by Mr. Jos. P. Gray, consulting Engineer. 3. The Report of a Special Committee of the National Fire Protection Association of the United States. Of the rest, some reports are said to be the wilfully distorted accounts of local officials on their defence, of local architects and contractors interested in the various buildings affected, of purveyors of fire-resisting materials desirous of proving the value of their wares, of Commissions and Commissioners with a specific purpose and that in the interest of some party or parties financially concerned in the fire, such as, for instance commissions of the Insurance Companies who had to keep an eye on the reduction of claims made against them and were inclined to take an optimistic view of damage done. Even experts of high standing Mr. Sachs finds are turned into special pleaders by "those far-reaching financial influences that appear to dominate every thing American." "The extraordinary power" he says "of certain sections of the so-called 'fire-proofing' trade of America is an extraordinary factor that has to be considered when dealing with the Baltimore fire, for that specialist trade stands in very close relation to the great contracting companies, and these again are in close business relationship with the great financial corporations, insurance, and other institutions that have money to place in real estate, and may thus be said to be directly or indirectly in touch with parties with whom relations would seem very unlikely in this country."

These comments on the nature of most of the conflagration literature explain the smallness of the portion of it that Mr. Sachs has taken for his record. They are also worth noting for the consideration of readers of fireproofing literature in general.

The reports included in the record and Mr. Sach's summary, deduced from his whole studies of the subject, come to conclusions so much in agreement and mutually supplementary that it will be useful to bring these conclusions together under subject heads, first to consider the evidence given of the behaviour of different building materials in the fire, and secondly, to consider more generally how the planning and construction of buildings can be made to contribute to their safety if attacked by fire.

MATERIALS.

HOLLOW TERRA COTTA TILE.—As a protective covering this has proved unsatisfactory in every situation. The principal trouble is that it breaks. It breaks in a heat less than that in which it was baked originally so that this cannot be due to chemical

change in the material. The explanation given is the difference of expansion between the part exposed to the fire, (which is constantly called the web in these reports) and that which runs in at right angles to the field of exposure and has one side adjacent to the dead air within the block. The consequence is a rupture at the junction, and the outer web, (the protecting flange) drops off. In the case of column coverings and partitions, the resulting instability appears to be sufficient to destroy the further usefulness of the protective covering and complete its ruin. Good work and good mortar in the first place would greatly increase the stability of this material and its value as a protection. The reports lay emphasis upon the extent of the losses in the Baltimore fire which are really due to bad workmanship.

The cure suggested is greater thickness of the "web". It is not the material which is at fault so much as its form. The web is now rarely more than $\frac{5}{8}$ in. thick and soon gets red hot. Prof. Norton questions "whether any floor, containing so little material on its outer faces as did these hollow blocks, could remain sufficiently cool in this fire to avoid serious injury by expansion." Capt. Sewell suggests that the web should have a minimum thickness of $1\frac{1}{2}$ in. (Mr. Sachs says 2 in.) "So that the entire variation in the temperature would occur within the thickness of the exposed web." Then he thinks "if made porous and "of good clay" the material "would probably be about equal to brickwork."

In the case of floor construction of this material Prof Norton thinks the rupture of the protecting flange is hastened by the constructive form—a segmental arch, expanding on its lower surface and crushing the members of that surface. The National Fire Protection Association give another reason for preferring flat arches to segmental; viz. that the lower face is further removed from the strain-curve of the arch, and the breaking of the lower face will not impair the strength of the arch, as it would if the arch were segmental.

All coverings for the lower flanges of beams and girders appear to have failed under intense heat; flange tiles held by the skew-backs of tile arches broke, as did shoe tiles for girders; sheet metal clips failed; tile which was only held in position by mortar dropped off. In some instances the failure of the shoe-tile also permitted the tile protection to the web plates of the girders to fall off.

The National Fire Protection Association adds to the floor question the following "conclusions":—"The space between the floor and the floor arch should be filled with concrete of a good quality. It is important that common cinders without any cement should not be used for this purpose. It has been found that, due to lack of a hard permanent filling for this space, large safes have fallen a distance of about six inches before striking the arch. This gives them some momentum, which adds to the shock which the arch is called upon to sustain."

BRICKWORK.—For an efficient fire resisting and protective material it is agreed there is nothing like well burned ordinary brick of good quality not vitrified, and well laid—in cement mortar for perfection. This Capt. Sewell says, will stand the application of both fire and water many times without damage to itself.

The 4 in. brick protection used on exterior columns and also on interior columns was without exception practically intact and as firm as before the fire. This coincides with the experience in former fires. Brickwork combines rigid construction and the necessary fire-resistive qualities.

As an external facing, where the question of appearance is involved, brickwork is not free from chipping; but it is in pressed brick facing that this was most noticeable. As a preventive of spalling, Capt. Sewell recommends round corners.

Prof. Norton found no fault with red bricks but says "where brickwork of a lighter colour, ornamented with terra cotta, was used, considerably more damage was noticeable, especially after the slight snow storms of the week following the fire."

*Journal of the British Fire Prevention Committee, 1 Waterloo Place, London, S. W. Single numbers 5 shillings. Annual subscription for the four numbers of the journal and occasional supplements 16 shillings (post free).

It is essential that brick facings should be properly bonded to the wall with headers. Metal ties and corner brick bonding (American bond) were proved inefficient. Capt. Sewell says "face bricks laid up without other bond than metal ties were stripped bodily from the wall in large areas. This is a new and strong argument against a very prevalent pernicious practice, and it is to be hoped it will be the beginning of the end."

ARCHITECTURAL TERRA COTTA.—Captain Sewell says, "there are records enough of hollow terra-cotta failing under expansion strains when heated. Still, it was thought that architectural terra-cotta was reasonably fire proof when used in external walls. Its behavior in Baltimore is a distinct disappointment, for it can no longer be classed as a fire proof material." It suffered worse than stone, for while all building stones spalled and chipped "the terra-cotta cracked and fell to pieces, and in some cases its color was changed and the heat seemed to have destroyed its texture so as to render the material soft and friable," and "highly ornamental terra-cotta suffered notably worse than that which was relatively plain." He suggested that "in the case of ornamental terra-cotta, it is possible that filling all the cavities with concrete might improve its fire-resisting qualities by preventing the exposed parts getting so hot as they do when backed by a dead air space, yet I saw some pieces of the Maryland Trust Building which had been filled with mortar, but which failed nevertheless."

STONE.—No building stone can be used for protection against fire. It is unsuitable from this point of view, both for construction and finish.

The exterior stone facing of walls was usually badly broken. Marble and granite are especially susceptible to damage. Interior marble finish was practically all destroyed. Marble not only spalls like granite, though not so badly, but calcines under long continued heat. Capt. Sewell found that stone with projecting parts of any kind suffered more than similar stones entirely flush with the wall. The reason is similar to that which causes the damage to terra-cotta; the projection of parts exposes a relatively small mass of the stone to sudden changes in temperature, while the body of the same stone remains relatively cool. This is true not only of mouldings and other ornament which projects beyond the ashlar face, but of variations in the ashlar face itself; it is the spalled face of the Custom House which furnished him with the text of this part of his discourse, as he found this damage "aggravated by the fact that most of the ashlar was cut with raised panels in the centre."

PLASTER.—The National Fire Protection Association makes the conclusion that "plaster blocks and plaster on metal lath are unsatisfactory for use as a fire-protective covering for columns or other structural metal work."

Plaster blocks, used to protect the columns in the Equitable Building, crumbled away from the columns and fell on the floor.

Plaster on metal lath had been previously found to be unreliable. It is especially susceptible to damage by hose streams. In this fire, Capt. Sewell says, "metal lath and plaster failed everywhere." Yet, though plaster is not sufficient in itself for a fireproof covering it is not without value in a fire. "Applied to other fireproof coverings," Capt. Sewell says, "it will in itself resist fire a long time and thus lessen the severity of the test for the material behind it."

CONCRETE.—All the reports speak well of concrete, though it does not appear in the conclusions of the National Fire Protection Association. Mr. Sachis wants concrete or composite metal and concrete floors in all business premises of the shop, warehouse, and factory class. He will admit terra-cotta for iron protection if nowhere thinner than two inches, and brick for partitions, but mentions concrete first.

Capt. Sewell's opinion is—"Concrete undergoes more or less molecular change in fire; subject to some spalling. Molecular change very slow. Calcined material does not spall off badly except at exposed square corners. Efficiency, on the whole, is high.

Preferable to commercial hollow tiles for both floor arches or slabs, and column and girder coverings. In form of reinforced concrete columns, beams, girders, and floor slabs, at least as desirable as steelwork protected with the best commercial hollow tiles. Stone concrete spalls worse than any other kind, because the pieces of stone contain air and moisture cavities, and the contents of these rupture the stone when hot. Gravel is stone that has had most of these cavities eliminated by splitting through them during long ages of exposure to the weather. It is therefore better for fire-resisting concrete than stone. Broken bricks, broken slag, ashes and clinker all make good fire-resisting concrete. Cinders containing much partly-burned coal are unsafe, because these particles actually burn out and weaken the concrete. Locomotive cinders kill the cement, besides being combustible. On the whole, cinder concrete is safe only when subject to the most rigid and intelligent supervision; when made properly, of proper materials, however, it is doubtful whether even brickwork is much superior to it in fire-resisting qualities, and nothing is superior to it in lightness, other things being equal."

One building in the Baltimore fire, No. 111 E. German Street, which was constructed throughout—columns, beams and floor arches—of reinforced concrete on the Hennebique system, had a severe test, as it was surrounded by non-fireproof buildings. Capt. Sewell reports of this building that in the lower storeys the concrete was absolutely unimpaired, though the contents of the building were all burned out. In the upper storeys where the heat was intense, (Prof. Norton found evidences of temperatures up to the softening point of iron) the concrete was calcined to a depth of $\frac{1}{4}$ to $\frac{3}{4}$ in., but it showed no tendency to spall except at exposed corners. The exposed corners of columns and girders were cracked and spalled, showing a tendency to round off to a curve of about 3 in. radius. Capt. Sewell takes from this a hint to round such corners to a radius of 3 in. in the first place, as a preventive of cracking and spalling, saying it would "add much to the resistance" not only of concrete, but "of all materials used in masonry, whether bricks, stone, concrete or terra-cotta—if they are exposed to fire." On wide flat surfaces the calcined material—which was here at the minimum of $\frac{1}{4}$ inch.—showed no tendency to come off, and Prof. Norton finds in this an additional protection against fire. He says:—"When brick or terra-cotta are heated no chemical action occurs, but when concrete is carried up to about 1000 degrees Fahrenheit its surface becomes decomposed, dehydration occurs and water is driven off. This process takes a relatively great amount of heat. It would take about as much heat to drive the water out of this outer quarter-inch of the concrete partition as it would to raise that quarter-inch to 1000 degrees Fahrenheit. Now a second action begins. After dehydration the concrete is much improved as a non-conductor, and yet through this layer of non-conducting material must pass all the heat to dehydrate and raise the temperature of the layers below, a process which cannot proceed with great speed."

Prof. Norton could find little difference in the action of the fire on stone concrete and on cinder concrete. He considers that the burning of bits of coal in poor cinder concrete is often balanced by the splitting of the stones in the stone concrete. He notes, however, that, owing to its density, stone concrete takes longer to heat through.

(A second article upon this subject will deal with lessons relating to planning and construction.)

A French architect, M. Pénin, who has recently been building on the site of the Hotel Mascani of Paris, an old mansion dated 1678, has nothing good to say of its construction. The floors, he says, sank by their own weight. In general, there was little where there ought to be much, and much where there ought to be little. To this decline, from the perfection of French construction in the Gothic centuries, some clue is given by M. Pénin's account of a flue which was carried of small—and presumably of reduced—girth through the middle of the floor beams. An architectural conception thrust upon the plan instead of proceeding from it falsified construction all through.

OUR ILLUSTRATIONS.

HOUSE IN NEW HAMPSHIRE.

The walls of this house are apparently of brick plastered white. The window shutters are not distinguished in colour, the sash bars carry the same colour across the openings and the roof is either silvered or stained with a silver gray. It is a strong case of simplicity and illustrates its power. There is however a scheme of decoration by climbing plants which owes its value partly to the simplicity of the background and partly to the extension of the trellis over the whole front, in lines which run with the horizontal lines of the openings and are in scale with the building. The nature of the trellis work is seen in the view of the doorway below. Its effect at a little distance, as seen in the general view is much more architectonic than the small diagonal lattice which we are accustomed to see. It adds to the character of the wall; and indeed the inventive designer may see in its apparent unity with the



DOORWAY OF HOUSE IN NEW HAMPSHIRE.

wall a suggestion for enriching the surface of a concrete wall by fillets formed in the course of its erection.

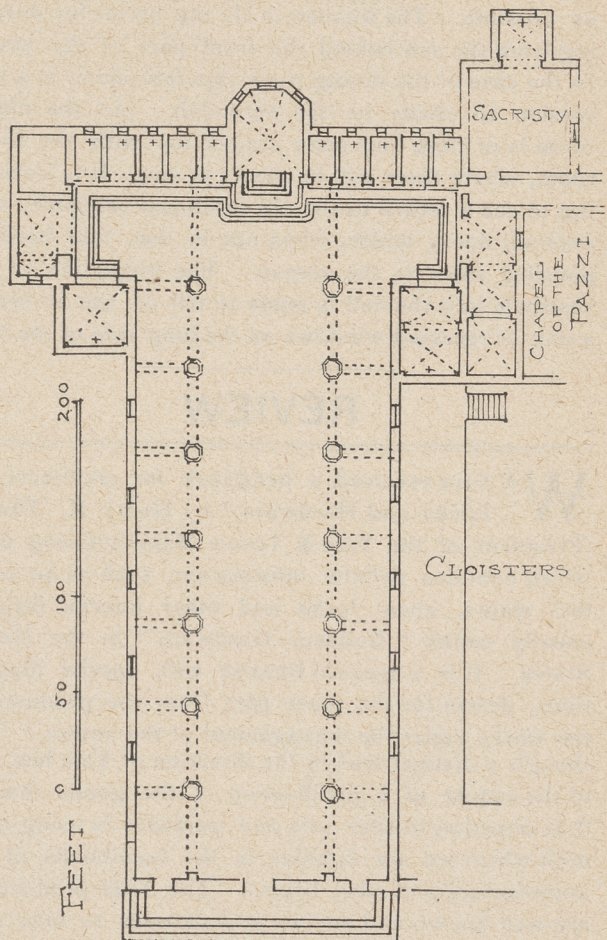
THE CHURCH OF SANTA CROCE, FLORENCE.

The Franciscans, for whom Santa Croce was built by Arnolfo di Lapo, were a preaching order and a poor one. They wanted a big plain church for little money; so that we have in Santa Croce an example of the thirteenth century treatment of a cheap job.

With the exception of the east end, it is as simple as a barn, but is nevertheless the most impressive church in Florence. Size has something to do with it but also the constructional vigour of its design. The nave arcade and aisle arches are 65 feet to the apex, and the plate of the main roof cannot be less than 90 feet above the floor. It is this great roof of king post trusses that is so impressive, partly from its height and partly from the frequency of the principals—about 12 feet on

centres. This, in a perspective of 350 feet gives an apparent closeness, which produces a beam effect upon a magnificent scale.

The apse of the east end does not occupy the width of the nave. Its relation is, as suits the T shaped



cross of the plan, rather with the ten chapels, two of which appear with it in the view up the nave shown on the illustration sheet. It will be noticed that the windows on either side of the apse are not in the same plane; the lower range being at the back of the chapels.

The aisles are roofed by a series of gables pitched from the backs of the aisle arches, which have, therefore, each a valley above. The timbering of these roofs shows within. This arrangement (which even in Italy must require some attention) was made for the sake of strength, and gives, much more than a sloping roof, an appearance of stability to the exterior.

HOUSE ON ROXBOROUGH STREET, TORONTO. — MESSRS. SPROATT AND ROLPH, ARCHITECTS.

The drawings on the illustration sheets are reduced to a scale of 8 feet to an inch. The house faces south. The main construction is simple and rectangular, but the plan is interesting from a variety of effect, due to recessing the windows on the south side, and to a difference of level between the drawing room and the living room, which appears again in the hall in the way of a pair of landings to reach the same level, for access from the hall to the dining room and to the kitchen department, which is, for the purpose of service, on the same level as the dining room. The first characteristic of the plan is, however, spaciousness, without which the variations in level would fail in effect and the recessed windows cease to have their present contrast with plain wall surface. The hall and living room placed end on to one another give the

house as much extension as possible on the south. The smaller size and different disposition of the drawing room make a change which relieves the interior—and also the front—from monotony. The dining room and kitchen arrangement is naturally made as compact as possible. The kitchen is all the better for retreating from the sun behind the front part of the house. In the case of the dining room this retirement is a concession to shade on the verandah; but the dining room is in close and open connection with the living room, where there will be plenty of sun. It is interesting to see a return to the old fashioned vestibule, with external doors which, when not in use, fold back as panelled sides to the recess. The projection of the vestibule into the hall is made to tell on the inside as a pair of recessed windows on the long side of the hall.

REVIEW

WE have received a handbook for architects, on Locks and Hardware,* by Henry R. Towne, (President of the Yale & Towne Manufacturing Co.), which contains definite information, such as an architect wants, about locks and other interior fittings, usually called "Builders Hardware" in the United States. It is a general treatise with special illustrations, drawn for the most part from the products of the works under the management of the author. This though a distinct lead in the direction of Yale has less of the nature of a justification of the goods than of that direction to their use and guidance in using them with which we are familiar in the handbooks of the manufacturers of steel beams. The Yale productions are well known and anyone who chooses to take suggestions from this handbook will do so from choice, knowing beforehand the standard of quality and looking only for information as to what will suit his requirements. The information he will find is as follows, divided into ten Parts:—

Part I. History, the development of lock making and "Art Metal Working" in America; chiefly a reprint of articles published at different times; one by Montgomery Schuyler on Artistic Hardware.

Part II. The Mechanics of Hardware. A valuable section, explaining, by the help of illustrations, the construction and mechanical characteristics of locks and other articles. A knowledge of this is essential for a proper selection and application of hardware finish.

Part III. Art Metal Work & Ornament. This consists chiefly of historical studies of all the Schools of Ornament (thirty four of them, beginning with the Cave Dwellers and ending with the Colonial School), by W. W. Kent. There are a great many illustrations showing characteristic examples of the Schools and, when the Yale & Towne Co. have produced hardware in one of these styles, illustrations are appended, with page numbers for their identification in the classified lists given later in the volume. This part concludes with a section on metals and their finishes and one on the obscure subject of the nomenclature of the finishes.

Parts IV. to VIII. give Classified Lists of Yale hardware; Locks and Latches, Locks in Sets, Plain Hardware, Hardware Groups and Cabinet Hardware.

All articles illustrated from photographs, all priced on a system which gives the relative value of different sets, materials, finishes, etc., and their absolute value near enough for the purpose of a preliminary estimate.

Part IX. Specifications and Forms of Contract.

Part X. Miscellaneous Information; among other things a useful hint about drawing for hardware and some illustrations of different types of casement window construction. There is a glossary of terms, at the beginning of the book, with the motto at the top—"Accuracy in Language promotes Accuracy in Business." The promotion of accuracy is the purpose of the book and constitutes its value.

CORRESPONDENCE

QUEBEC, December 3, 1904.

Editor CANADIAN ARCHITECT & BUILDER:

Sir,—Among the usual number of pertinent articles in your last issue, I find "Suggestions from New Zealand as to escape from theatres in case of fire or panic."

The suggestions are all excellent; but would prove to be useless after a very short season of probation, as no theatre lessee could ever be made to carry them out on account of the curtailing of his profits by as much as it would cost nightly and yearly to pay men to attend to so many entrances and exits and especially in a climate like this, where, if emergency issues were provided with doors opening outward on to iron landings and stairs the same would have to be attended to night and day after every fall of snow or because of ice and sleet offering an obstacle to the outward opening of the doors.

We have had a terrible example of this in the case of the Par's Charity Bazaar, where, though seven emergency doors had been provided, and were at hand to do the needful; the wealthy promoters of the bazaar would not incur the expense of as many men as doors, with instructions not to leave their posts on any pretence and to throw open the doors immediately on the very or mere suspicion of a fire or panic of any kind.

Had this been done, not a single life would have been lost, though of course the inmates would have been the worse of a singed head and burnt shoulders from the burning and falling draperies from above, but all of which would have been restored, hair regrown, scars have disappeared within a few months after the occurrence.

The most instructive lesson in the way of escape from danger in the case of the burning of a theatre, was admittedly that of the latest Chicago horror, where during the conflagration of a new theatre, more than 700 persons lost their lives.

The commissioners named to report on the cause of the catastrophe, arrived at the conclusions which, had they been arrived at and carried out before the fire occurred, would likely have reduced the fire to one without loss of life and have saved half the edifice, the auditorium side, from destruction.

In this case there was on the auditorium side of the building a large ventilator or opening extending from the auditorium ceiling to and through the roof of the building. This, as its name implies, was for the purpose of ventilation—while over the stage end of the theatre there was no ventilator or opening of any kind. Now, say the commissioners, it is especially on the stage side of the edifice that such an opening should have been provided, extending from the stage ceiling to and through the roof.

The tendency of heated air and gases is, as must be well known, to rise vertically and seek an issue into the atmosphere. The hot air and smoke would thus have no tendency to rush, as it did, towards and into the auditorium through the proscenium arch to gain an exit by the auditorium ventilator.

The proscenium was provided with a fire-proof curtain or screen of asbestos. This curtain was not a rolling one; but slid or moved up and down bodily, its ends being armed with slides which were confined by vertical guides for the purpose.

An attempt was of course made to lower this curtain or screen down to the stage floor, which would have effectually cut off the flames from reaching the auditorium side of the building; but all attempts were unavailable to move the screen further down than to within fourteen feet of the floor of the stage; due to the pressure which the current of heated gases from the stage end, where the fire occurred (and always does occur), pressing the curtain slides so tightly against the outer side or auditorium side of the

*Locks and Builders' Hardware, by Henry R. Towne. Profusely illustrated. John Wiley & Sons, 43 to 45 E. Nineteenth Street, New York. \$3.00.

guides, that no force would move it beyond the point it had reached.

The smoke and hot air therefore having no issue from above the stage, continued to pour through the proscenium arch into the auditorium side of the building where it is probable and consoling to think that the audience were asphyxiated before the flames had time to reach them.

The commissioners insist that had there been over the stage end of the building a proper exit for the heated gases, they would have risen vertically to egress through the same without any tendency to invade the auditorium to seek an exit on that side of the proscenium wall or wall of separation between the stage and auditorium.

This then, of all the possible solutions of probable escape with one's life from a theatre where the stage is on fire (and there is not the least tendency of the fire starting on the auditorium side of the curtain) the true and only one—independently of all other facilities of exit as recommended by the New Zealand architect—is the existence, above the stage, of such an opening as would allow of the smoke and gases passing out direct into the atmosphere, without any tendency whatever to take any other direction.

Of course the opening in the roof, and especially in such a climate as Canada, must be closed to keep the cold out and prevent loss of heat; but this could easily be managed by topping it with a ridge roof of such an acute angle (say 60° at apex) as to cause snow to fall off it, and the opposite flaps or shutters of which would be worked from the stage floor level of the building by wire ropes or even by hempen ones passing down along the walls through iron conductor tubes to prevent the possibility of the ropes themselves being burned by the burning scenery.

In 1854, when the writer designed the Quebec theatre "Academy of Music," asbestos was, so to say, unknown, and there was to have been a solid screen of iron, for raising which bodily there had been provided sufficient height in the roosting above the stage.

This screen or curtain, to disguise or dissimulate it, was to have been covered with mirror in vertical strips of say 3 to 5 ft. in width held in position by silvered sash base riveted to the body of the screen.

Such a curtain reflecting, when down, the whole audience, would have had a fine effect, and at any rate, of whatever nature, such a cut-fire screen should be at hand in all theatres and a cut-fire wall extending from the very foundations to above roof of building, with no other opening than the proscenium arch, or iron doors to other openings through it, if indispensable.

In conclusion, as any additional precaution can never be "*de trop*" and on this head, it may be remarked that in rebuilding the theatre at Antwerp, Belgium, destroyed by fire some 10 or more years ago, a recommendation made by the writer in a paper of his read before the Society of Architects of Canada in 1888, was carried out, and each of the five tiers of surrounding galleries above dress circle level was provided with exterior iron balconies and some 25 doors or exits, 125 in all, leading thereto with outer iron stairs from each tier down to ground level; this allowing of emptying the building of its inmates in less than half a minute of time; while, of course, the stage end of the edifice is also amply provided with issues to the same effect.

CHAS. BAILLARGÉ.

Mr. Baillargé's suggestion strikes at the root of the danger in theatres. The difficulty of a large opening which must be kept closed and yet must be thrown open in an instant is no doubt as susceptible of solution by automatic action as is the operation of the ordinary fire door. No matter how heavy the doors of the opening may be, if they are hung on pivots it is but a little weight that would make the difference between the balance that keeps them shut and the balance that throws them open.—ED. CANADIAN ARCHITECT AND BUILDER.

A QUESTION OF FEES.

An Ontario architect writes as follows:

The writer wishes to obtain a recognised schedule in pamphlet or book form of the fees that architects are entitled to for full and partial services as architects. Also wish to ask what is usually understood by the profession as full professional services. Does it mean constant attendance at the building during construction, if not, how often would any representative of the firm be required to visit the works to comply with the term full professional services to their client, in the absence of any special

agreement. . . . A large portion of the proposed scheme was abandoned. Are the architects entitled to collect the usual proportion of fees for plans, specifications, details, surveys and measurements. Also the obtaining of proposals from contractors for the same. In this locality the custom has been to collect 50% of the full fees customary.

Answer.—In reply to your letter of November 24, asking for information about architects fees and services: The only Ontario tariff is that of the Ontario Association of Architects, which we cannot very well procure for you if you are not a member of the Association, and indeed it would be of no service to you unless you are. The only scale of charges recognizable by a court of law in a case of a disputed fee, where there has been no preliminary agreement, is the scale which has been in use by the architect or the body to which he belongs; the presumption being that there was a tacit acceptance by both parties of what is customary in that neighbourhood or known to be the previous custom of the architect. You have a right therefore to claim for your work what you have been accustomed to charge; or, in case of discontinued work, for that proportion of the fee which you have been accustomed to charge for the proportion of the work done. On this head the schedule of the Ontario Association reads: "For partial service or in case of the abandonment or suspension of the work, the charge for partial service is as follows: Preliminary studies, 1-5 of the full commission. Preliminary studies and general drawings and specifications sufficient for estimate and contract, 1-2 of the full commission. Preliminary studies, general drawings, specifications and details, 4-5 of the full commission. For superintendence alone, 2-5 of the full commission for the work to be superintended." This is generally considered to divide the fee into parts fairly proportionate to the amount of work set off against each part.

As to superintendence there is no way of measuring it except by efficiency. The intention in superintendence is to see that a work is being carried out in conformity with the design, specifications and directions, so that the work is as suitable for its purpose as it was intended to be; and to watch its progress with a view to certifying correctly the payments that are due as the work progresses. The architect, in the absence of a more definite arrangement, is supposed to judge for himself when and how often visits should be made for these purposes, and the only proof of his neglect will be in results.

A QUESTION ABOUT VENTILATION.

A correspondent asks for information as to recent methods of ventilation:

Answer.—A reply to your request for information as to recent methods of ventilation is a matter far beyond the scope of a letter. There can hardly be said to be new methods, only new contrivances for carrying out the one old and only method—the application of power to move the air. Of these contrivances the simplest is heat, and, inasmuch as ventilation is usually required during the winter months, the application of heat is within the compass of everybody building in this country. Ventilation and heating should be studied together as one scheme, calculated in mutual relation; but this requires science, and to that end study, for which purpose an excellent book is Heating and Ventilation by Professor Carpenter of Cornell University. It is published by John Wiley & Sons, New York, and the catalogue price is \$4.00.

AN ENGINEERING FAMILY.

The City of Quebec has appointed Mr. W. D. Baillargé to the office of City Engineer; the place his father, Mr. Charles Baillargé, filled, with so much distinction, for 33 years.

The United States Government through the Bureau of Forestry is carrying on some interesting experiments in order to determine the rate at which different kinds of timber will season. Certain kinds of timber, it is known, are improved by being soaked in water for different periods of time, but the chemical or physical changes which occur are not fully understood, with the result that the best economic usage of timber is largely a matter of accident. The enquiry referred to may prove highly valuable in discovering means for the arrest of decay, the best utilization of certain parts of the tree, and so forth.

AFFAIRS IN TORONTO.

THE site of the new building for the Toronto Public Library is not settled. As far as users are concerned, there seems to be good arguments for both down-town and up-town sites; but the balance is in favour of an up-town site for the permanent and valuable part of the library, which will be used by students, and a lending branch in the city. The site chosen is the Perkins estate on College street, where the building will be in close association with the university group and on a thoroughfare which, from this association and from other accidents in its course, has more possibilities for the creation of beauty than is usual in the streets of Toronto. It is impossible, however, from the point of view of advantage to the neighbourhood in which the building is placed, not to regret the loss of an occasion given, if the site adjacent to the City Hall had been found desirable, to make the proposition include the whole block of land between the City Hall and Osgoode Hall. The argument would have been that, if we house valuable books and unique documents in the middle of a great-risk fire district, the building that contains them should be isolated; the result would have been the redemption of that part of Queen Street.

THE air of Toronto is heavy with building projects. The Union station is an actuality. Messrs. Darling & Pearson, E. J. Lennox and A. H. Chapman, (the latter associated, for this purpose, with Messrs. Sproatt & Rolph) are understood to be retained as competitors for the new building, if they are not as yet actually engaged upon it. Its erection will mean the transformation of Front street between Yonge and York streets.

THE EXHIBITION BOARD will soon be applying for a grant from the city. They are talking of new buildings. There was also some mention of a plan of the grounds, but not in the same breath; not at any rate with the same amount of breath. If, however, their request for a grant is to be supported by anything definite, it should include a definite plan of the grounds. The success of the Exhibition appears to be such as to justify the City Council in taking a hand in its extension and improvement, but, though the money given is given for building, the value of the buildings, as a means of making the Fair attractive, depends so much upon their disposition upon the grounds that it is a plan of the grounds that chiefly concerns the custodians of the public purse.

THE UNIVERSITY is about to begin the Convocation Hall, for which plans have been prepared for some time, and the Ontario Government will expend, on a new building for the department of Physics, the \$180,000 received from the Grand Trunk Railway as the purchase price for the old Parliament Buildings on Front street. It is understood that the position of this building in relation to the other University buildings has already been considered. If it is anywhere within grouping distance of the main building, it is to be hoped that it will fulfil the obligation—difficult, but possible—of harmony without imitation. The great want in the University set of buildings is of a plain type that

will harmonize with the ornate main building. This has been done at Columbia. The scientific buildings are machine shops and the library is a monument, but they harmonize.

A UNIVERSITY RESIDENCE is being talked of. Mr. E. C. Whitney, of Ottawa, has given, to the trustees of the University, \$15,000 to be the nucleus of such a residence. A good deal more will have to be got before anything can be done, but the sum ultimately aimed at need not all be got at once. A good suggestion was made, in the newspaper account of the presentation of the gift, that the proposed residence should be a composition of units which could be built separately; the whole when completed enclosing a quadrangle. Each house would hold fifty or sixty men who would be under the general direction of a member of the faculty in charge of the house. University men are, like other men, but children of a larger growth, and the growth is not only less large but comes upon them rather suddenly, when they leave the restraints of school for a freedom such as they never had before, nor indeed, it may be said, are likely ever to have again. Personal influence of the right kind is even more important than rule in making the most of the double opportunity—the opportunity for studious seclusion, and, at the same time, for constant association with equal minds—which makes the charm and is the advantage of college residence life. And this influence is most effective where the field is not too large. Houses for 50 or 60 making the sides of a common central space, quadrangular or otherwise, would make an excellent system of formation for a residence or a series of residences at the University. It can be built, a unit at a time, as funds come in. If the University had succeeded in selling its land to the north of Hoskin avenue it might now have the funds for such a residence but it would not have the land. Now, in consequence of that fortunate failure, it has the land and, as the province is on the bound, there may be, now or soon, other people who have the funds.

THE HOUSING QUESTION has, with the approach of winter, become more acutely felt to be a serious matter. Inconvenience is felt by all classes, but the poor are suffering. It is an expensive matter for a whole family to board. Poor people must have a domicile of some kind, and the shifts they have been put to are sometimes startling. Homes are made in stables, sheds, old street cars, tar-paper shacks, etc.; all duly visited by a local reporter with the freedom of a friend of the family; and the willingness shown, by those he visited, to talk about their affairs is a symptom of the strain they are feeling. The occasion has roused Mr. Goldwin Smith to try to organize a joint-stock company to build workmen's houses and rent them on the basis of a fair profit for the capital invested. This is a large-minded and truly philanthropic scheme. To apply money where the public good requires it, and, while asking for a fair profit, to ask for nothing more, is a conception of the use of capital, which, if it obtained generally, would bring about happiness on the earth without failure and without delay. It is to be hoped that this scheme will work without failure, and also—as the need for it is pressing—without delay.

MONTREAL.

THE YEARS CHANGES IN THE CITY.

Of city buildings which are likely permanently to enhance or detract from the beauty of the town, the greatest number during the past year has been erected in St. James street. There the banks congregate and it is these institutions which have easily held the lead in building operations not only by the number and extent but also by the costly and substantial character of their enterprises. As a rule too they have set excellent examples in erecting buildings of good fireproof character—the system of casted steel work with flat terra cotta arching for the floors being adhered to in almost every instance.

The 'armed cement' construction usually adopted for the roof of this class of buildings suggests the favorite French method of fireproofing; but though now being advertised here we do not know of any examples where a "beton armé" system has been thoroughly applied in Canada. Apart from banks, we still see too many commercial buildings being built with little or no attempt at fireproofing. That this should be done by private firms is not, perhaps, very suprising, but it is wholly so to find the new wing of the law courts setting the example of wooden joisted floors at this time of day.

We have formerly spoken at some length about the head office of the Bank of Montreal—easily the first in architectural merit of all the buildings in the city. The works which have been in progress there are now nearing completion and the 87th annual meeting of the bank was held in its new chambers on the 5th December.

Of the other banks in St. James Street, the Bank of Ottawa building nearly completed and that of the Sovereign Bank, now hastening to get its steel skeleton clothed in more comfortable materials, both have soared to the full height permissible by the city bye-laws. Both belong to a type of design derived from the high buildings of American cities. That is to say, they endeavor to present a building of extremely high narrow proportion and to preserve unity of effect by strongly emphasizing a storey or two at the bottom to provide an architectural base, again strongly modelling the top as a crowning member, leaving the intermediate storeys plain as a contrasting body. These are from the designs of Mr. H. C. Stone.

On the opposite side of the street the Metropolitan Bank designed by Messrs. Finley & Spence shows on a smaller scale a similar general treatment and it is here very palpable that the smaller bulk bringing the whole building more within the compass of the eye is more suited to carry a scale of detail which can be refined without losing strength and interest.

For the Imperial Bank, the large building at the south end of Victoria Square, which was gutted by fire a couple of years ago, has been remodelled under the direction of Mr. A. T. Taylor, whose departure for England makes an important change in the ranks of the Architects of Montreal.

The Royal Bank of Canada's new building in St. Catharine Street and also the small branch of the Bank of Montreal in Greene Avenue close by were referred to last month. Farther east in St. Catharine Street, Mr. A. H. Lapierre has erected a three storey building of Quebec limestone for the City and District Savings Bank, the exterior of which is now completed.

Outside of St. James Street, the "down town" streets present few important changes. A new building is now being erected at the corner of Notre Dame Street and Cote St. Lambert—the result of expropriation changes. The principal improvement in Craig Street has been the recent thinning of the forest of telegraph poles, which helps to make that locality so picturesque. Some of the finest giants have lately been felled in pursuance, we understand, of the intention to have the wires generally placed underground.

As regards stores nothing of first-class importance has been carried out during 1904. Perhaps the greatest number of new works of this class is in St. Catharine Street. W. H. Scroggie Limited have completed the structural work of an addition to their store which, if not rising to architectural magnificence, at least completes the block from street to street in a uniform and tidy manner. The Renouf building, almost opposite, was completed early in the year, and in Union Avenue, not many yards away, a new store built and elaborately finished for a fashionable tailor exhibits much careful ingenuity of design.

In some of these buildings one may observe a rather pleasant introduction of delicately modelled broad metal frames around the store windows. If this treatment does not compensate for

the architectural defect inherent in the slenderness of support that shopkeepers demand, it has, at any rate, the merit of giving interest and emphasizing the metallic nature of the supports.

In St. Denis street, not far from the corner of St. Catherine street, the Polytechnic School has recently been completed. This excellent building, from the office of Mr. E. Vanier, is one that has an agreeable air of appropriateness to its purpose. Designed without undue ambition its well understood and wholesome detail raises it well above the commonplace.

The building for the McGill Young Men's Christian Association in Sherbrooke street has now almost attained its full height and the Montreal Amateur Athletic Association premises in Peel street, referred to in a previous issue, are being completed internally. At a similar stage, or rather less advanced, is the new Maternity hospital at the corner of St. Urbain and Prince Arthur streets.

Of dwellings large numbers have been built during the year, mostly of a humble class in the poorer outskirts. A striking feature in the better localities is the number of apartment houses which have appeared; some of them new, but many the result of a transformation of private dwellings which have been swelled out in all their dimensions to contain as many apartments as possible. In these it need hardly be said the money making purpose is more obvious than the architectural excellence. They are, however, eloquent witnesses to a particular feature in the life of the citizens. Montreal becomes more and more markedly a city where one half of the population makes its living by keeping house for the other half, and the people with a private home life of their own are becoming a smaller and smaller proportion of the whole.

For next season's operations they are now getting in the foundations for a large hardware store in Bleury street, near Craig street, Mr. H. C. Stone being the architect, and a new seven-storey fireproof store is advertised as about to take the place of some of the older buildings on the south side of St. Catherine street, a little west of Peel street. The McGill Students' Union building and the new club house of the Mount Royal Club, both in Sherbrooke street, give signs of being prepared to spring up with the coming of spring. Next year should also see substantial progress made with the new Notre Dame hospital and the Fever hospital at Point St. Charles. The erection of the latter has been delayed, we understand, owing to certain preliminary financial difficulties.

CONCORDIA SALUS.

THE NEW PEACE PALACE AT THE HAGUE.

Every one who has visited Brussels, the beautiful capital of Belgium, will remember the splendid pile of the Palace of Justice which forms such a striking feature in the modern architecture of that city. That building has been decided upon as the model for the new Peace Palace at The Hague, which is to be erected through the gift of Mr. Andrew Carnegie, and which, on a smaller scale, will be exactly similar to it. The new palace will cost \$1,640,000, and will be a superbly beautiful building. The main audience-room, where the sessions of the Court of Arbitration will be held, will be 270 feet long by 120 feet wide, and will cover no less than 12,000 square feet in area. In addition, there will be a committee room, and on the second floor two spacious rooms, one for the president and the other for the secretary of the permanent Court of Arbitration. The dome surmounting the palace will be supported by two galleries, the lower square shaped, the upper, round, flanked by great bronze statues of Clemency, Justice, Law and Strength.

A PLUMBING EXHIBIT.

PROVINCIAL BOARD OF HEALTH PLANS UNIQUE DEMONSTRATION

The Provincial Board of Health is providing space for an exhibition of specimens of plumbing work and fixtures, ancient and modern, to demonstrate in a practical way the great advance which has been made in the manufacture and installation of the same. Mr. M. J. Quinn, for twenty years mechanical superintendent of the Public Works Department, is making the collection for the board. The specimens will not only be exhibited, but lectures and practical talks will be given to all interested, with a view to implanting and cultivating a correct idea of the intimate relations between proper hygienic conditions and sanitary plumbing.

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries, neither do we undertake to answer questions in issue following their appearance.]

From "Builders": Is there any composition that will make brickwork impervious to damp that will not discolor the brick?

Ans.—If "Builders" will proceed as follows he can make his brick wall damp-proof as far as rain, snow or sleet is concerned, if, however, the wall has no damp-proof courses built in the foundation, damp may be drawn up from the ground and permeate the whole of the building.

Take $\frac{3}{4}$ of a pound of mottled soap and dissolve in one gallon of boiling water and spread the hot solution over the surface, taking care it does not lather. Allow this 24 hours to dry, when a solution formed of a quarter of a pound of alum, dissolved in two gallons of water is to be applied in a similar manner over the coating of soap. The operation should be performed in dry, settled weather. The soap and alum mutually decompose each other, and form an insoluble varnish which the rain is unable to penetrate, and dampness is effectually removed. Another method consists in the employment of sulphurized oil as a varnish or paint, which will also improve the color of the brickwork, as well as preserve it. This is prepared by subjecting eight parts of linseed oil and one part of sulphur to a temperature of 278 degrees in an iron vessel. This will keep out both air and moisture, and prevent deposits of soot and dirt, when applied with a brush to the surface of either brick, wood or stone.

From "North West": About what thickness should a concrete wall for a house be, and what proportion of cement, stone and sand should be used in making the concrete, and what method should be employed in doing the work? Is a house built of concrete as cheap or cheaper than a brick house? About what thickness should a cellar floor of concrete be to be solid and durable?

Ans.—In making concrete walls, much depends upon their thickness. If the walls are then in proportion to their height, the concrete should not be weaker than about 4 to 1, say two parts brick or stone broken to pass through a 2-in. ring, two parts, sand, and one part best Portland cement. The framing is arranged as follows: The foundations having been laid, uprights are fixed in the ground in pairs about 3 feet apart, and $10\frac{3}{4}$ inches from each other; on the inner sides of these uprights 1 in. floorboards are nailed, so as to form a mould for the wall, the rough sides of the boards being towards the uprights and the smooth sides facing each other. At cross walls, four uprights set in the form of a square will be required; where walls are at right angles, one upright at each angle and one at the outsides will be enough. Each pair of uprights should be tied together three or four times in their height by 2 in. by $1\frac{1}{2}$ in. laths, which must be left in position, until the concrete has set. Not more than 3 feet (in height) of concrete should be placed in position at once; and in order to facilitate construction the upper boarding may be left off until the lower part of the concrete has set. After the boarding has been removed the ties should be knocked out and the holes pointed up. So much depends in setting the framing, and on the local prices for material that the cost of the work cannot possibly be estimated. Unless the works are several miles distant from the brickfield, the cost will probably not be higher than the ordinary brickwork set in cement mortar. A 6 inch floor will be the proper thickness for a good piece of work, the proportions may be 5 to 1, and the work should be well rammed with a flat beater, then trowelled to a smooth surface.

From "Builder," I was pleased with your answer

last month on estimating and would feel grateful for more information in the same direction, and would ask you to give a few hints as to the proper order of procedure in making out an estimate? The subject is one of great importance to building contractors all over the country, and I am sure that my trespassing on your columns in this matter, will not be resented by your many readers.

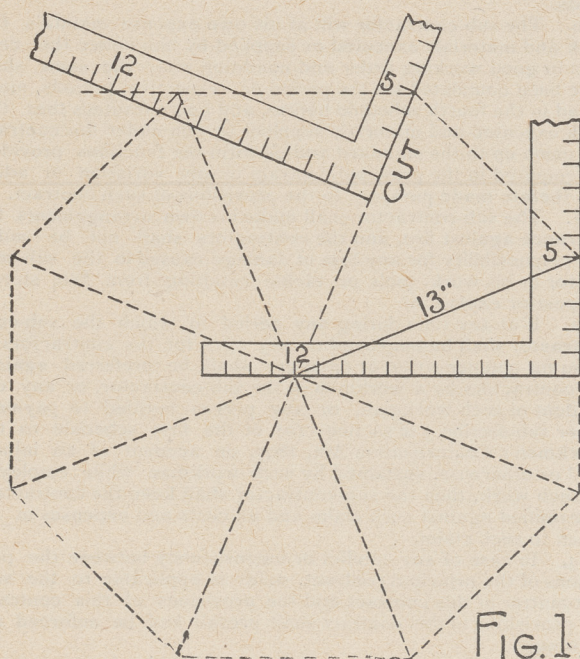
Ans.—It would be impossible for us to give anything like an exhaustive essay on this subject in the space at our command, however the following may prove of some value to "Builder" and others. The first thing a young builder should do before commencing to make an estimate will be to provide himself with a list of items requiring to be done on the proposed work and the styles, qualities and amounts of materials of all sorts necessary to complete the work. Having them on his memoranda, and a goodly supply of price-lists within reach, he may then commence work at once.

Foundations will be the first thing to consider, and in order to get at the cost of the work closely, he should know the character of the ground to be excavated, whether clay, gravel, sand, or other material. Then he must know what it will cost per yard to remove this and where the surplus is to be dumped. Drains will next require his attention; the number of feet, size and style of drain, cost per foot laid in place and covered, including all traps, joints, angles and connections. A survey of all site—which the estimator may make himself—should he understand the use of architect or builder's level (which every builder should own), will give a correct idea of the grades and the amount of digging to be done, which should be accurately measured and charged up. Next comes the stone work, including the preparation of the footings which may be piling, concrete, or large "through stones" in either case the time and material must be considered and provided for. Post footings and putting in place should be a separate item. The stone walls follow, including all "dwarf walls," buttresses, piers, and separate foundation, for chimneys, fireplaces, etc. Remember the mason, in measuring stone work measures the outside girth which gives him the benefit of one thickness of wall at each angle. Provide for damp course between stone and brick, which may be of slate, lead or asphalt, as the specifications may direct. Do not overload relieving arches over all openings both in stone and brick work, as they require more time to construct than the ordinary wall. Openings in rubble stone work should be charged up solid, as cutting waste cost as much as though the wall had no break in it. One hundred and twenty-eight cubic feet will measure in the wall scant one hundred cut feet. It is better and safer always to allow ninety-six cut feet for every cord of stone, worked stone measures the same in wall as on ground. The foregoing merely gives an outline of the course to be taken by the estimator. Commencing with the excavating he should continue until every item required to complete the structure in every particular has been provided for; bearing in mind all the time that the smallest thing about a building cost money, and if he should overlook an item, by a loose system of estimating he will find at the close of the work that his profits will be cut down in proportion, as the architect or owner will justly demand the overlooked items be furnished at the contractor's expense. It will not do to lump the small items, as it frequently done by unsuccessful or careless estimators, for the lump sum may be greatly in excess of actual cost and fair profits, and may cause the estimate to be too high, or it may be too low, thus causing a serious loss. The successful estimator generally has on his desk, when figuring on a piece of work, what is called a "Tickler." This may be a small book or it may be a series of cards on which are written all the items of labor, skilled and otherwise, required upon any style of building with prices by day or by piece work, when such is available. Also the prices of materials of all sorts and sizes, in

cluding lumber in all states, stones, brick, hardware, glass, plumbers' goods, roofing, paints, oils, etc. Having a list of this kind before him, with prices attached, the estimator will not be likely to overlook any item in the proposed building he may figure on. The items in the "tickler" should commence with laying out the ground for foundation; digging drains; excavating for cellar and foundations, walls; then all the items required for this work, including concrete and cement for cellar floors or brick paving, if such is used. The superstructure should follow, with windows, doors, floors, furring, partitions, stucco work and plastering, etc.; every particular in connection with the work. Then comes the carpenters' and joiners' work, including putting down floors, putting up trim, building stairs, hanging and trimming doors, putting in sash, weights, pulleys, etc. Painters' and finishers' work follow, including all necessary materials and labor. Then follow heating, bell hanging, lighting, etc.

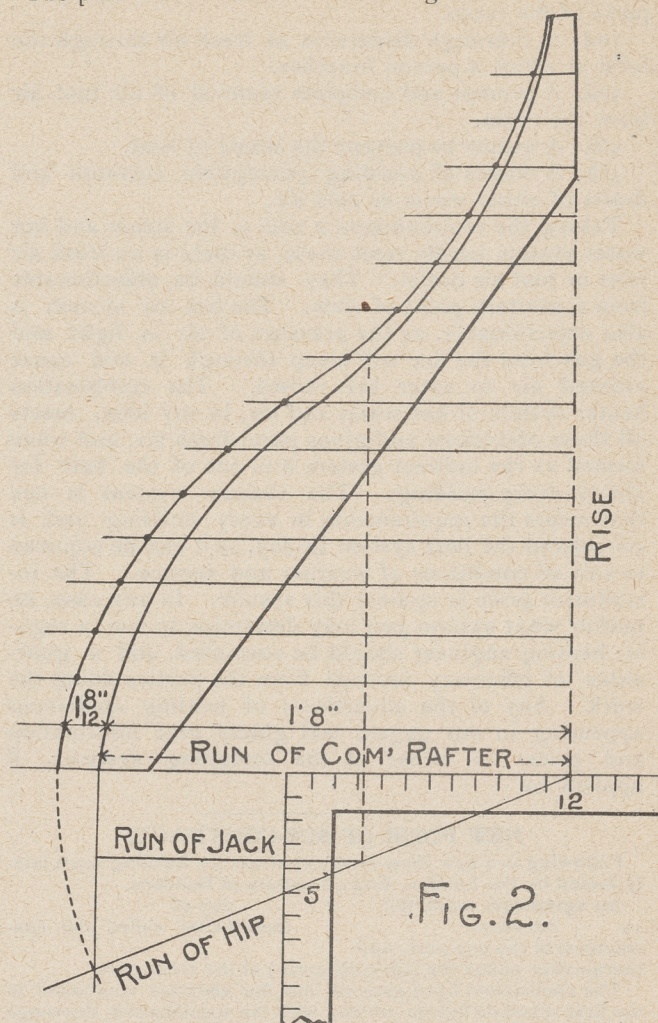
From "Carpenter," Kindly explain how a "hip rafter" on an octagon roof can be so shaped, as to be on the same plane as the common rafters, whether straight or curved, the problem to be solved by using the steel square only?

Ans.: To shape the hip so as to be on the same plane as the common rafter, may be accurately done by the following rule; Twelve and 5 gives the octagon cut nearly (the correct figures are 12 and 4.97 inches, or in their ratio), however nearly enough for practical purposes. See Fig. 1. Now let us study these figures. A line from 12 to 5 on the steel square forms an angle, the same as that formed by the position of the runs of the common and hip rafters. We also find that this line is exactly 13 inches in length, which is a gain of one inch per foot run over that of the common rafter. Now let us apply the above to a full size diagram as represented in Fig. 2. Lay off the run and rise of the common rafter and give it the desired curve. Draw any number of lines parallel with the run, from the rise to a few inches beyond the curve given the common rafter. Measure these lines from rise to curve, and for each foot and fraction of foot add to same line outside of the curve as many inches and twelfths of inches as the lines are feet and inches in length. Thus, the second line measures 1 foot, 8 inches, the addition therefore is 18-12 inches.



After all of the lines have been thus measured, draw an offhand curve through the cheeks, which will be the proper curve at the center of the hip. To get the gauge line for backing the hip, space back on the lines 5-24 of the thickness of the hip and draw a line through these points,

The plan in connection with this figure is 1-16 full



size. It is only used here to find out what part of the common rafter is required for the jack.

From "Contractor": I am to put in a heating plant in a nine room house, and am at a loss to know what system of heating to employ, and am reaching out for information on the subject. Would you kindly make a few suggestions and oblige?

Ans.—In making suggestions we should know the kind of building for which the plant is required; we suppose however, the building is of brick. Hot air has merits over all heating systems if properly installed in the building, but the hot air heater which is installed in the dwelling house has very few merits and several objections. The amount of fuel is one, as the conversion of heat into power so that it will be driven through the conductor to the room to be heated will cause loss of heat, as the hot air must be about 40 degrees hotter when entering the room than the temperature of the room, and the coefficient of efficiency of a hot air furnace is from 50 to 60 per cent., therefore the estimate of fuel required must be increased from 66 to 100 per cent. There are many other objections to the hot air system which would take too much space to describe. Steam is a good heating medium. Hot water has many qualities over it for house work. If we will look to temperature of vaporization we will find the latent heat to change one pound of water from heating point 212 degrees to steam at the same temperature is 966 heat units. Again, it will be seen that a hotter fire must be used to make steam, than for hot water, and still they are both at the same temperature. Then the hot water has the merit in the amount of fuel saved. Hot water will hold the heat longer than either of the other mediums and a large volume of hot water acts as a reservoir of heat. It maintains a temperature for a considerable time after the fire has failed, whereas steam and hot air will not.

In the general conditions of a heating system, the following requirements should be considered,

1st. A uniform distribution of heat throughout all parts of the room.

2nd. A thorough dispersion of fresh air through the level in which a person breathes.

3rd. A prompt and complete removal of all foul air from the room.

4th. A means to prevent the waste of heat.

5th. A means of avoiding perceptible currents and drafts of either warm or cold air.

Taking the requirements 2 and 3, the steam and hot water system hardly meet them, as there is no fresh air inlet or foul air outlet. They should be objectionable from a sanitary point of view. The hot air system is also objectionable, as the pressure of air is light and the gas from the fire will creep through it and cause vitiated air to enter the rooms. The combination heater system of hot water and air, in my idea, meets all these objections and gives pure, fresh air, and when formed as the indirect system it is one of the best for almost every building. The vacuum system is one that meets the requirements in every building and is considered the best system to-day, as it can be adjusted to suit all conditions of weather and service. The installment price is against this system. In any case, no matter what system you may determine to use, a regular heating engineer should be consulted, and a guarantee of efficiency secured from the parties doing the work. Any of the advertisers of heating appliances appearing in our pages, will gladly give information and prices of either of the foregoing systems, if applied to.

NEW FORM OF SUB-CONTRACT.

Following is a new form of sub-contract for building work lately issued by the London, Eng., Institute of Builders.

An agreement made the _____ day of _____ 19____, between _____ (hereinafter called the contractors) of the one part, and _____ (hereinafter called the sub-contractor) of the other part.

The contractors have entered into the contract mentioned in the first schedule hereto which, with the specification, drawings and conditions, is hereinafter included in the expression the principal contract.

It has been agreed between the parties hereto that the sub-contractor shall execute and supply for the buildings and work to be executed under the principal contract the work and materials specified in the second schedule hereto, upon and subject to the terms and condition hereinafter contained.

Now it is hereby agreed as follows:—

1. The sub-contractor will do and perform all the obligations imposed upon or undertaken by the contractors under the principal contract in respect of the work and materials referred to in the said second schedule hereto to the satisfaction of the contractors and of the architect under the principal contract—hereinafter referred to as the architect—and in such manner as the contractors shall direct or require.

2. The sub-contractor having full knowledge of the terms, stipulations and conditions of the principal contract agrees to abide by, perform and keep the same so far as they are applicable to the subject-matter of this contract as fully as if the same had been herein set forth at length, and as if he were the contractors under such contract, and in particular will remove or make good any defects or defective work or materials which the architect or the contractors may require to have removed, remedied or made good at any time during the progress of the works or within the period named in the principal contract as the period of maintenance, and in the event of the sub-contractor becoming bankrupt or committing any act of bankruptcy, the contractors are to have the same and the like powers over the plant, chattels, materials and property of the sub-contractor, on the site, as are given to the employers over the contractors and their plant and materials, in and by the principal contract in such an event.

3. The sub-contractor will complete and deliver up the works and the respective sections thereof to be executed under this contract at the time or within the respective times specified in the first column of the third schedule hereto, and in case of default—unless such default shall be attributable to strike or lock-out of the sub-contractor's workmen or other cause which the contractors or, in case of their refusal, the architect shall consider such as to entitle the contractors to an extension of time under the principal contract—will pay to the contractors the amount mentioned in the second column of the third schedule as liquidated and agreed damages which the contractors are hereby authorized to deduct from any moneys due or to become payable under this contract. It is expressly agreed that the respective amounts mentioned in such schedule are severally applicable to the respective portions of work against which they are set, so that two or more or all of them may run and be payable concurrently.

4. The contractors are to be entitled to determine this contract in the event of the works not progressing to their reasonable

satisfaction, or the goods or any part thereof not being delivered within the time or respective times stated in the third schedule, and default being made by the sub-contractor in complying with a written notice from the contractors to proceed with the works or deliver the goods, as the case may be, for a period named in such notice not being less than three working days. In the event of the contract being determined under this clause an account shall be taken of the amount due for work executed or materials delivered and of the damages or increased cost caused to either party by delay or breach of contract, and the balance due either to or from the contractors shall be ascertained and paid accordingly. In case of difference the amount shall be a matter for arbitration under clause 14, and the decision of the arbitrator shall be final.

5. The contractors shall provide at their own expense all water required by the sub-contractor for the purposes of this contract, and the sub-contractor shall have the use, in common with the workmen of the contractors and of other sub-contractors, of existing scaffolding only. The sub-contractor shall, however, satisfy himself that any scaffolding used for the purpose of this contract is fit and proper for his purpose, and shall be solely responsible for any accidents which may result from the user of such scaffolding or plant by himself or men in his employ, and shall make good any damage to scaffolding or plant belonging to the contractors, or any portion of the work in course of execution, done or caused by any act, neglect or default of himself or of any men in his employ.

6. The sub-contractor will provide at his own expense any temporary workshops, sheds or messrooms required for his workmen, at such places on the site as the contractors may appoint, and also provide any fuel, light and watching required for his work.

7. All works executed and goods delivered under this contract shall be executed and made to the satisfaction of the contractors and of the architect. No variations shall be made unless authorized by the contractors in writing. The amount payable or to be allowed in respect of all authorized variations which may be made in the works or goods the subject of this contract, is unless otherwise agreed between the parties, to be adjusted under the provisions of the principal contract.

8. The price to be paid to the sub-contractor shall be the price named or to be ascertained in the manner provided in the fifth schedule, and payments shall be made by the contractors to the sub-contractor as the work proceeds at the rate and by the instalments mentioned in such schedule (but so that no payment shall become due to the sub-contractor under this contract unless and until the architect shall have included in a certificate an amount in respect of the works executed under this contract for which payment is being claimed), and unless otherwise provided in the schedule the final balance shall only be payable as and when the contractors receive their final payment.

9. If the sub-contractor shall for three days after written notice from the contractors refuse or neglect to make good any defective work or to remove any goods or materials which the contractors or the architect may consider unfit or improper or defective, and to forth-with re-execute the work in a proper manner or supply proper goods or materials in the place thereof, the cost of making good, removing and supplying any such work, goods or materials as aforesaid shall be paid by the sub-contractor or deducted by the contractors from any moneys in their hands.

10. The sub-contractor will at his own expense maintain the work and materials executed or supplied by him under this contract in good working order and condition after the same shall have been completed for the period or respective periods mentioned in the fourth schedule hereto, and he guarantees that the work executed and materials supplied by him under this contract will come up to the standard and perform the functions provided and required in the principal contract or any variation or addition thereto made pursuant to the provisions of such contract.

11. The sub-contractor shall make his own arrangements for insurance against fire, and the contractors shall not be under any responsibility for any loss of damage caused to the sub-contractor or his work, tools or tackle resulting from fire, storm, tempest or explosion.

12. If at any time during any period in which the sub-contractor shall be employed on any work for the contractors a claim for compensation or damages shall be preferred against the contractors by a workman of the sub-contractor, or any dependent of such workman, or any person entitled to payment under sub-section 3 of section 1 (a) of the first schedule to the Workmen's Compensation Act, 1897, on account of an injury, fatal or otherwise, sustained by such workman while employed on such work, then the sub-contractor shall keep the contractors indemnified against such claim and all costs and expenses in relation to such claim.

13. In case of any conflict or inconsistency between the provisions of the principal contract, so far as applicable to the subject-matter of this contract and the provisions of this contract, the provisions of this contract shall prevail and be enforced accordingly.

14. In case any dispute or difference should arise under this contract or any matter or thing therein referred to, or anything to be done under and in pursuance thereof, such dispute shall from time to time be referred to some person to be agreed upon between the parties, or failing agreement to the president for the time being of the Institute of Builders, or some person nominated by him.

As witness the hands of the parties.

[Here follow the five schedules.]

MR. JOSEPH CONNOLLY.

Mr. Connolly's death, on Dec. 13, closes what was, until the last two or three years, a very active architectural career in Ontario. Mr. Connolly was in his 65th year. He was born in Limerick, but passed most of his life in this country. He was a member of the Irish Royal Institute of Architects, and was one of the most accomplished of Canadian architects. He was trained in the office of Mr. McCarthy, of Dublin, who held a similar position among Irish architects to that occupied by Sir Gilbert Scott in England. After serving for a time as Mr. McCarthy's chief assistant, and subsequently making a tour upon the continent for the sake of study, Mr. Connolly began practice in Limerick. He did not, however, remain long there, but came to Canada, and soon acquired the special practice for the Roman Catholic church which was his life's work, and which enabled him to continue always (excepting upon one or two occasions) to design in the style in which he was trained and in which he worked with freedom and originality. Besides a great deal in the way of alterations, additions and improvements to Roman Catholic churches and institutions, including the additions to St. Michael's Cathedral, in Toronto, and its decorations, the following buildings were his work :—

In Toronto : The Chapel of St. Joseph's Convent.

The south wing and Chapel of the House of Providence.

St. Paul's Church (Italian Romanesque.)

The Sunnyside Orphanage.

Some Roman Catholic Schools.

St. Mary's Church (his last work.)

In Kingston : The new front and tower of the Cathedral and several churches.

In Hamilton : The remodeling of St. Mary's Cathedral. St. Patrick's Church.

The James Street Baptist Church.

In London : St. Peter's Cathedral and many Roman Catholic churches in the diocese.

The Franciscan Church in Chatham.

The Jesuit Church in Guelph.

Churches in Prescott, Kemptville, Tweed, Kincora, Formosa, Sault Ste Marie, Caledon, Arthur and many others, including St. Michael's church in Belleville, the destruction of which the other day was the cause of so many lamentations in Belleville.

An American Forest Congress will be held at Washington on Jan. 2-6, 1905, under the auspices of the American Forestry Association. Its purpose will be to establish a broader understanding of the forest in its relation to the great industries depending on it ; to advance the conservative use of forest resources for both the present and the future need of these industries ; and to stimulate and unite all efforts to perpetuate the forest as a permanent resource of the nation. This purpose is one which deserves the hearty support of engineers and architects, for the increasing cost of timber indicates that the time is soon at hand when forestry will become one of the most imperatively needed callings in the country. Anything that can be done to spread an appreciation of its importance deserves hearty support. The secretary of the Congress is Mr. W. L. Hall, Atlantic Building, Washington.

MOVING AND ERECTING LARGE GRANITE COLUMNS.

Around the altar of the Cathedral of St. John the Divine in New York, there is to be a semicircular row of eight granite columns 6 ft. in diameter and 54 ft. in height. Each column is made in two pieces, the lower one being 36 ft. long and weighing 90 tons. The upper one is seated without doweling on its flat top, has a length of 18 ft. and weighs 40 tons. The columns were quarried and cut at the Bodwell Granite Co.'s Fox Island quarries at Vinalhaven, Me. At first it was intended to make them monolithic and no special difficulty was experienced in quarrying full-length slabs from a stratum of about the required thickness. These were hand-dressed approximately cylindrical and the first one was successfully turned in the lathe but broke while being polished. The break was attributed to torsion and for the second column power was applied at both ends of the lathe. Notwithstanding this arrangement, the column broke during the roughing. It was then suggested that the trouble lay with the excessive bending stresses due to the very long unsupported length and a center support was provided for the third column. This column broke more quickly than either of its predecessors and the attempt to make them monolithic was then abandoned.

The shorter pieces were turned and polished without difficulty and were then enclosed in cylindrical cases made with 3 x 4 in. steel-hooped wooden staves set close together and secured to circular end pieces. They were loaded on barges, two complete columns to each, and were towed to New York. Skids were arranged from the deck to the shore and several turns of wire cable were taken around the middle of the column. One end was made fast to a hoisting engine and the free end was kept tight as the rope was overhauled and rolled the column easily to shore. Each piece was loaded on a special wagon and transported over a mile through the city streets and up a considerable grade to the site.

The wagon was built in Maine expressly for use on this work and is of simple and massive construction. It consists essentially of two pairs of wheels, two longitudinal beams and two cradles on the axles, and is built entirely of wood except the axles, tires and a few bolts and small braces. The 10 x 12-in. longitudinal timbers are 30 ft. long, are 3½ ft. apart on centers and overhang the front and rear axles about 2 ft. and 5 ft., respectively. The 8 x 8-in. rear axle and the 7 x 7-in. front axle each has six U-bolts fastening a solid 10 x 14-in. wooden bolster to the upper side. On the front axle the bolster supports a horizontal wooden turntable platform or fifth wheel, on which the longitudinal timbers are seated. At the rear end they are seated directly on the bolster. Solid fillers are put on the axles between and above the longitudinals and are concaved on the upper surface to a radius of 3 ft. to receive the columns which are thus supported about 4 ft. clear of the pavement.

The rear wheels are about 4 ft. and the front wheels about 3 ft. in diameter, all of them being 20 in. thick and made with seven thicknesses of planed white oak plank. Each thickness is made of sixteen sectors in the large wheel and twelve sectors in the small wheel, bolted together and breaking joints in adjacent thicknesses. A steel disc is bolted to the center of the wheel on each side and through it and the solid planks a hole was bored to fit the axle, so that the bearing of the latter was on the ends of the fibers. The tires consist of four 5 x 1-in. welded rings sunk on each wheel. The rear wheels are provided with a break shoe operated by a screw, but it was seldom necessary use this, most purposes being served by a transverse timber chained to the axle and dragging on the ground close to the wheels, but clear of them so long as the wagon advances. If the wagon tends to move backwards, the timber immediately serves to chock the wheels.

The wagon was hauled by a six-part manilla rope tackle which had a clevis attachment to a sheave set in

LEGAL.

A legal decision of both interest and importance to all concerned in the building trade and its allied professions was given last week by Mr. Justice Ridley, sitting without a jury. The question was apparently a simple one: If an architect and surveyor makes plans, drawings, specifications for an employer and is paid therefor, has the architect (in the absence of any special condition) the property in these documents? To that question some business men of experience would give a confident affirmative answer, while others would reply with a very emphatic negative. To state briefly the facts of this case (*Gibbon v Pease*), the plaintiff owned some property at Bayswater which he wished to convert into flats, and for that purpose he employed the defendant as his architect and surveyor, and an agreement was entered into by a firm of contractors, that they should execute the necessary work under the directions of the defendant. The local water company would not pass defendant's plans, whereupon Gibbon, the plaintiff, instructed a firm of plumbers to smooth over the difficulty, and to do that part of the work to the satisfaction of the water company. The defendant, not having any notice of this arrangement, expressed his annoyance that a professional slight had been put upon him. However, the work proceeded and was in due time finished, and upon its completion plaintiff asked his architect for his charges and paid them without demur. Gibbons thereafter asked Pease for the plans and other documents referring to the property, but Pease absolutely declined to hand them over, alleging that, beyond a *lien* for his charges, he had the absolute property in the documents according to a universal and well-known custom in the trade. Hence the action to compel defendant to hand them over. In the schedule of the Royal Institute of British Architects, paragraph 16 reads: "In respect of the ownership of drawings and specifications, it has hitherto been the general custom for the architect to be paid for their use only, *those documents remaining his property* . . . No authoritative decision in the courts of law has yet been given on the subject; it is therefore desirable, that for the present at least, that the architect should have a distinct understanding with his employer on this point."

Against this two strong opinions may be pitted. First, in his "Book on Buildings," Lord Grimthorpe sets out in full the standing form of agreement with an architect in use by the Commissioners of Works. There paragraph 6 runs: "The plans and the documents relating to the work shall be the property of the Commissioners—*i.e.*, at once; not merely after the work is done—and the architect shall make at his own expense all copies of them necessary for the conduct of the work." Secondly, paragraph 17 of the same is as follows: "No rules of the Royal Institute of British Architects or any other society to be held binding on the Commissioners."

It should be added that the decisions on the point under discussion are so uncertain and conflicting, that

Mr. Justice Ridley felt himself compelled to take his own, and he entered judgment for the plaintiff, with stay of execution for three weeks pending an appeal. The matter will certainly go to the Court of Appeal, and we shall at last have a definite settlement of what has been for a long time a too-much-vexed question.—The (London) Contract Journal.

HOPEWELL V. KENNEDY.—Judgment by Chief Justice Meredith, in the Divisional Court, Toronto, on appeal by defendant from an order of the Judge of the County of Carleton, sitting at Ottawa Spring Assizes, for the Assize Judge. The action is for libel and being called for trial and before the empanelling of a jury, plaintiff's counsel moved for order to strike out certain paragraphs of defence and defendant's counterclaim. The order was made with leave to defendant to amend. The plaintiff, an Alderman of the city of Ottawa, and a member of the Building Committee of the Public Library, for the stonework and masonry of which defendant was contractor, made certain criticisms in committee in respect of work done by defendant upon the building. The libel complained of was embodied in a letter by defendant published in The Ottawa Evening Journal, 23rd October, 1903, in answer to plaintiff's criticisms. The point involved in the appeal is whether the defendant's statements were privileged. Held, that the plaintiff made no appeal to the public in offering his criticisms at a committee meeting, and that it was not open to defendant to enlarge the constituency created by the plaintiff and claim a privileged occasion. Some of the paragraphs are deemed admissible in mitigation of damages, and limited to that purpose, may be so pleaded. As to the counter-claim, held, that the reference therein to the charges as set forth in the statement of defence, and the further allegations that such charges were falsely and maliciously spoken by plaintiff, are quite sufficient to make the counter-claim in its present form a good pleading within rule 268. Appeal allowed as regards counter-claim and dismissed as regards statement of defence. Defendant may amend within five days. No costs of appeal on order appealed from. H. M. Mowat, K.C., for defendant. No one for plaintiff.

The new Union station at Toronto will cost \$3,000,000. The architects who have been asked to prepare plans are Messrs. Darling & Pearson, Mr. E. J. Lennox, and Mr. A. H. Chapman.

Definite announcement is made of a new union depot for Emerson, Manitoba. Four of the five railroads entering the town viz., the Canadian Pacific, Great Northern, Canadian Northern, and Minneapolis, St. Paul & S. S. Marie Railway, will construct a new international union depot on the border where the four lines intersect. Owing to the fact that two of the companies interested are American and two Canadian a like portion of the depot will be placed on each side of the international line.

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NOTES.

We regret to record the death of Mr. John Hillock, a well known figure among the builders of Toronto. Mr. Hillock, when making a Thanksgiving Day visit to his daughter, the wife of Dr. Addison, of Penetanguishene, caught a cold from which pneumonia developed. He was born in Toronto in 1834 and had lived there all his life. He is survived by four daughters, three of whom reside in Toronto.

Mr. John Moser, a well-known American architect, died at the age of seventy-two, at Atlanta. In early life he practised in Ohio and in Canada, but in his later years he settled in Alabama and Georgia, after having filled the place of a designer in the office of the Supervising Architect, under Mr. M. E. Bell. Amongst the buildings designed by Mr. Moser may be named the Cotton Exchange at Galveston, Tex., and St. Philip's Episcopal Cathedral in Atlanta, Ga., the latter being carried out in association with Mr. E. G. Lind.

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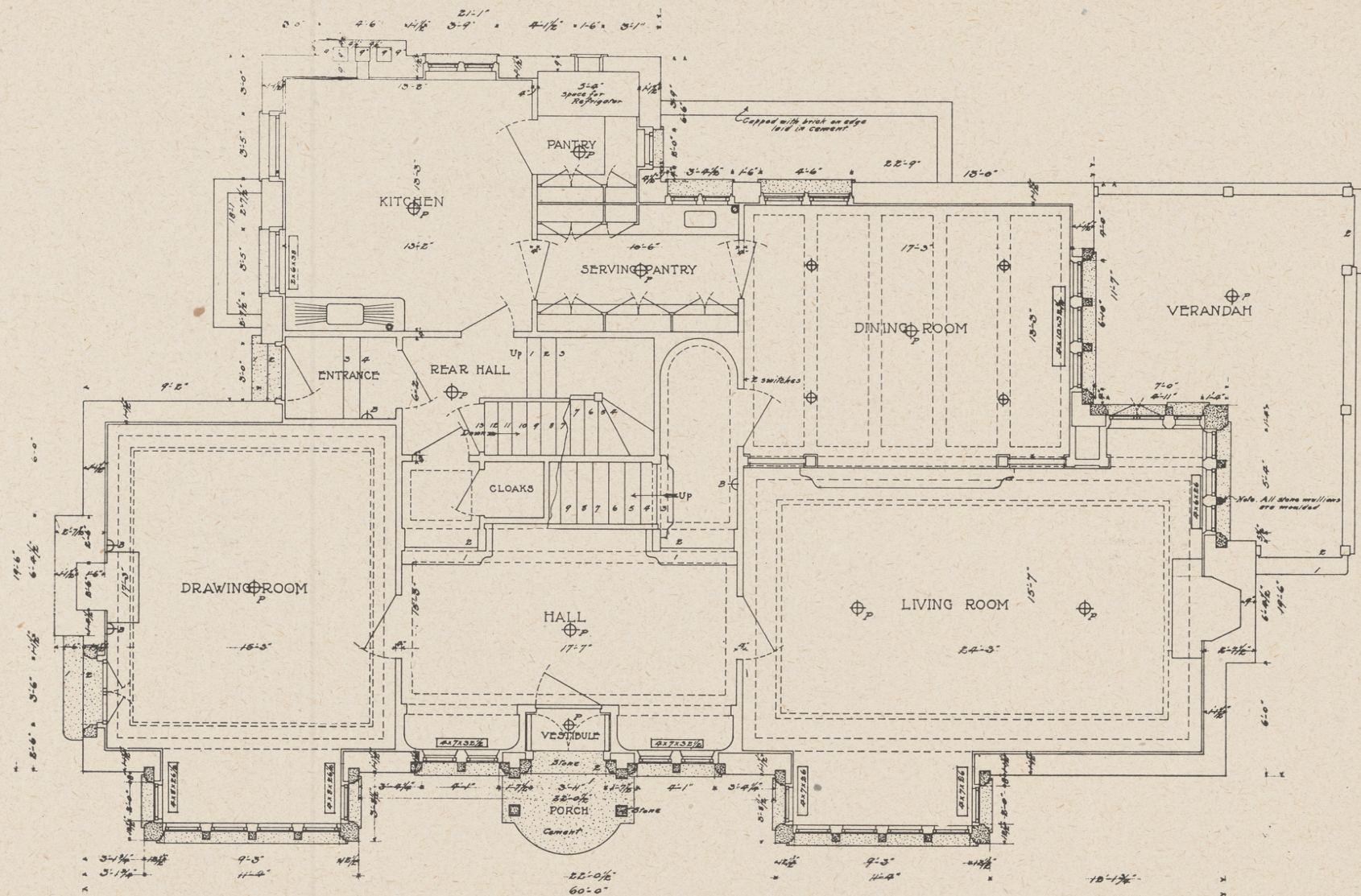


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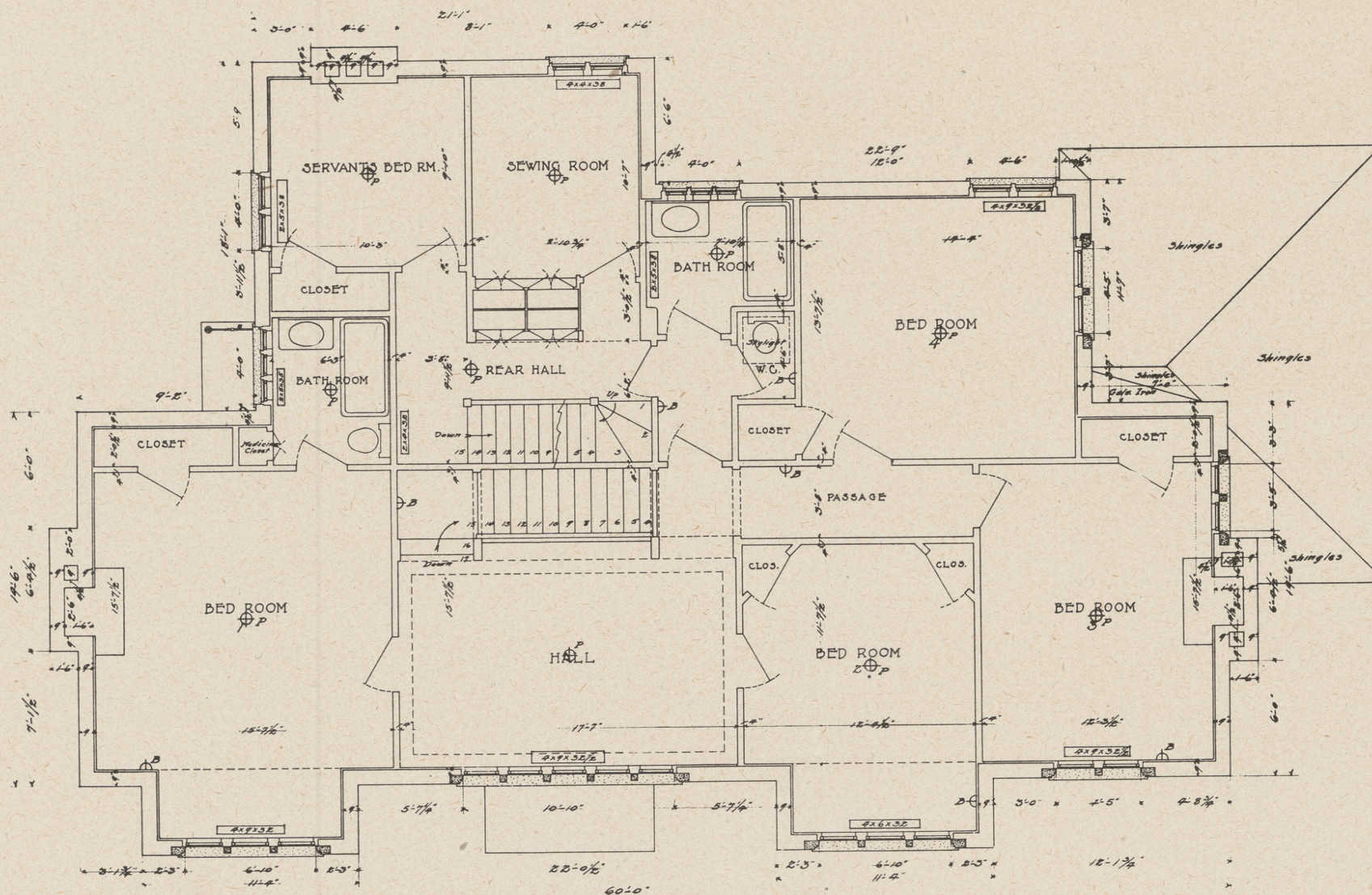
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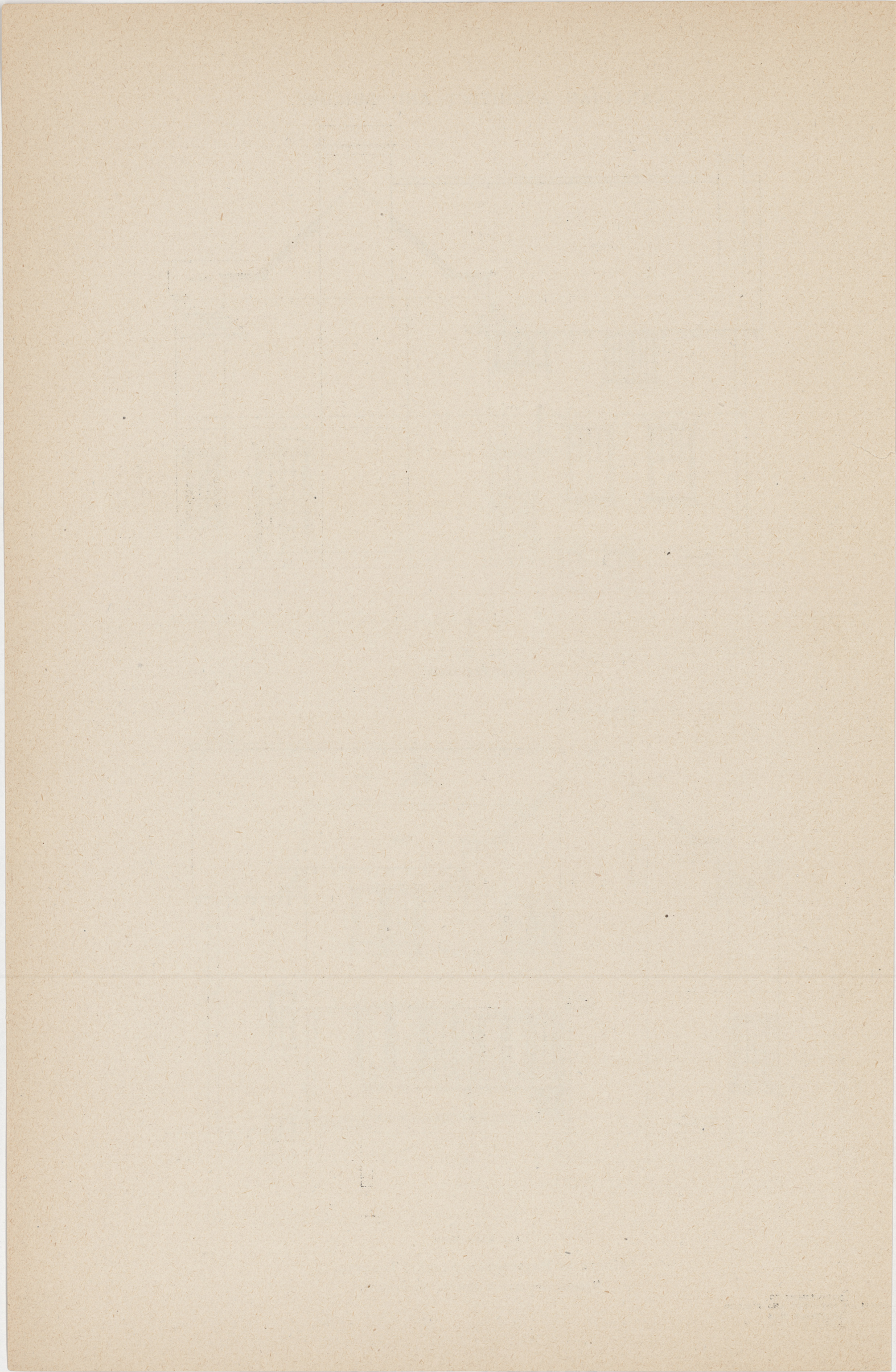


WEST ELEVATION.



EAST ELEVATION.

HOUSE IN ROXBOROUGH STREET, TORONTO.
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THE RAPID CONSTRUCTION OF AN OFFICE BUILDING.

The rapidity with which high office buildings are sometimes erected is a source of wonder to many people, and it really is not surprising that such is the case. A recent example is that of the 15-story building now nearing completion at the south-west corner of State and Madison streets, Chicago, known as the Chicago Savings Bank Building. In the erection of the steel frame the figure 17 is rather prominent. It did not, however, prove itself an unlucky number for either the contractors for the work or for the owner. In all there are 17 floors, and in the construction of the framework 1,700 tons of steel were used. This was erected in just 17 days, or an average of 100 tons of material were used each day.

No special means were employed to rush the work. The speed with which the steel was put together was due largely to the systematic methods with which the work was carried out. There were, however, no delays because of lack of material, the steel being delivered as fast as it could be used.

The completion of the exterior of the building has been carried out with the same rapidity as was that of the framework. The setting of the tile floor was accomplished at the rate of five floors a week. The plumbing, heating, electric wiring, plastering and other portions of the work followed as closely as the state of the building would permit, so that at the present time, in less than three months after the first steel was set,

the building is well along towards completion.—Engineering Record.

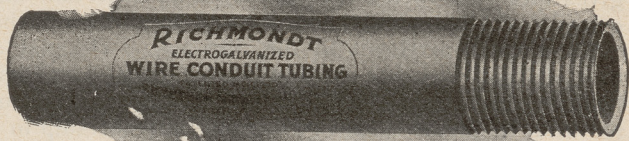
To this account should be added the following extract from the report of Capt. Sewell on the Baltimore fire: "The modern building erected in record-breaking time is never a model of workmanship, and often it contains defects that reduce the factor of safety almost to unity. The standard of work that prevails in these hastily-erected structures would not be tolerated for a moment in general engineering works."—ED.

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RATIONAL LABOR VIEWS.

Wisdom is evolved from experience, and as experience becomes known the world grows wiser. In a recent address, Mr. Terrance V. Powderly expressed the opinion that strikes were no longer useful to those who engaged in them. Statistics go far to sustain him in his opinion. Not ten per cent. of the strikes instituted during the past twenty years were successful from the workman's position, and where victory was achieved, it was gained at such dear cost and sacrifice that the instigators were virtually the losers. Another advocate of the adoption of rational measures to settle labor disputes is Rev. A. B. Mitchell, pastor of the First Methodist Episcopal Church, at Cleveland, Ohio. The church over which he presides is in the workingmen's district and the greater part of his congregation is composed of wage earners. Rev. Mr. Mitchell is a man endowed with a more than ordinary amount of ministerial common sense. His observation is not warped by prejudice nor blinded by self-interest. He has a remarkably clear conception of things and he gives utterance to his convictions in no uncertain language. On Labor day he delivered an address to his congregation, pertinent to the occasion. The gist of that address was that in this free country every man has the right to sell his labor to whom he pleases and for what he pleases; that compulsory membership in a trades union, in order to procure employment, is un-American and intolerable; that every employer should have the right to decide whom he shall employ and that the principle of the open shop should everywhere prevail; that differences between employer and employee should be amicably settled by arbitration; that both capital and labor should be organized for mutual benefit, and that labor should share with capital its profits and losses; that every man should be paid according to his earning capacity and not according to a uniform wage scale; that capital must recognize the right of labor to organize for its own protection and

benefit and such laborers should not be discriminated against, so long as they do not interfere with the rights of others; that a workman cannot quit his job and hold it at the same time; he has no right to prevent another from taking up the task he has voluntarily laid down; that the principle of the boycott and sympathetic strike is to be condemned; the effort to destroy another man's business is un-American and un-Christian; that employes who have taken the place of strikers have the right to be retained after the strike is settled, and finally that the basic principles of Christianity must be applied in all capital and labor relations. In the main Mr. Mitchell's deductions are correct, and while he has enunciated nothing new to the readers of the Journal, his views have value as emanating from a disinterested source. Concisely he supports the contention that capital has the right to go into the open market and purchase labor for what price labor is willing to sell and that labor is entitled to all it can get without coercion or obstructive methods.—Architects' and Builders' Journal.

MOVING A BRICK OFFICE WHILE IN USE.

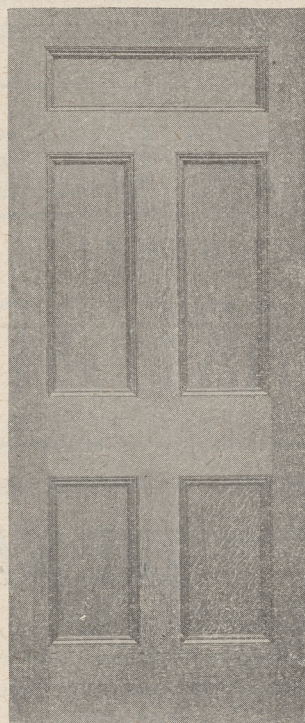
Although a large brick office of the Fred M. Prescott Steam Pump Co., West Allis, near Milwaukee, is being moved several hundred feet, occupants suffer no inconvenience and continue their labors uninterrupted. The building is being moved to Sixty-third and Greenfield avenues to make room for an extension of 100 feet to one of the machine shops. Steam heat is furnished to the building by means of a long hose. A cable from a near telephone pole keeps the telephone service intact and electric wires laid on the ground keep the building supplied with light. The large brick vault, containing a heavy safe, was lifted and taken with the building. A movable stairway, arranged like the gang plank of an ocean liner, is used to gain access to the building.

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PRISMATIC GLASS.

The prismatic lighting of dark interiors has of recent years received considerable attention, says the Irish Builder, as it mitigates an evil necessarily associated with the crowding into towns and the erection of high buildings. Prismatic glass is a great improvement on the antiquated reflector, which was not only an eyesore, but generally inefficient, and all forms of such glass are to be recommended, though of course some are better than others, the most satisfactory test in commercial use being personal observation of the degree of improved lighting produced by various makers, for as each problem requires separate treatment and the glass needs to be proportioned as it were to the situation, it means that scientific application and intelligent supervision are often better than greater theoretical efficiency. The "MAXimum Light Glass" (an American invention) at the same time possesses many theoretical advantages. As regards the theoretical value of this patent form of prismatic glass, the fact that the John Scott Legacy medal of Edinburgh was awarded it testifies to its scientific design. The distinctive feature about "MAXimum Light Glass" is that it has a lenticular instead of the usual plane surface (i. e., its front side has a number of rounded ribs or panels, which are virtually lenses.) The lense ribs run transversely to the direction of the prisms on the inside surface. We would point out what this means.

By way of introduction we may state that the object of all prismatic glass is to gather light impinging in a downward direction at a more or less sharp angle, by reason of the narrowness of streets or courts, and to alter its direction so as to transmit it into the room. This is done by the prisms, the angles of which should be suited to the room so as to throw the light into the furthest corner; but this has led to the erroneous conclusion that as much of the light as possible should be transmitted parallel to the walls, floor and ceiling of the room. The result of such a procedure is that shadows are cast by objects in the room. After the first desideratum has been achieved, namely, that as much extraneous light as possible shall be directed into the interior, and practically all the designs in prismatic glass are equal theoretically in this respect, the next consideration is how to direct it to the best advantage, and, as shadows are most objectionable, to diffuse the light evenly over the room. The way to do this is to transmit the light on divergent lines so as to cause it to strike the bounding walls, ceiling and floor of the apartment

and be reflected from them so as to counteract and neutralize the shadows. Glass which is simply prismatic and not lenticular exaggerates the divergency of the transmitted light in the vertical plane only and directs the light in the horizontal plane in parallel lines without diverging it. If lenses are formed on the other (outward) face of the glass running exactly the same way as the prisms the divergency in the vertical plane is increased, but no alteration is caused as regards the horizontal plane. The lenses, however, have an indirect advantage over the flat surface by total reflection, and they look better than the latter. By running the lenticular panels transversely to the prisms the light is transmitted divergently in both the horizontal and the vertical planes, while additional light is gathered as explained above. In this way practically all shadows are overcome, especially if two windows can be placed in the same apartment, as then the light from one completely overlaps that from the other. This arrangement of lenses and prisms has the advantage also of giving extra strength and allows the larger size of prisms to be readily made, and also the thickness is less compared with other forms, which is an advantage, since there is a loss of light from absorption in every glass. The "MAXimum Light Glass" is made in larger sheets than usual, namely, 18 in. long by 60 in. high, and thus all the many usual joints are avoided. Twenty-one different angles are made, so that the glass may be suited to each particular condition of site and length of apartment. It has truer prisms without so many flaws or roughness as are usual in this kind of glass, and as each blemish means loss of efficiency, this is another important point. When the light comes from high up it reduces to a minimum the use of artificial light. It has been used in 1,200 different windows in London alone during the past month, and recently it has been fixed in several places in Dublin.

STRIKES IN CANADA.

The loss of time to employes through trade disputes throughout Canada during June was approximately 62,488 working days. This is an increase of nearly 30,000 days compared with the previous month, and is largely accounted for by a strike of iron and steel workers at Sydney, Nova Scotia, in which 39,000 working days were lost. In June, 1903, there was a loss of 122,612 working days, about 60,000 more than in the present year.

CANADIAN MARBLE.

A letter comes from Glasgow this week to the secretary of the Toronto Board of Trade. It asks for a general description of the marble being quarried in Canada, clear and natural, pointing out what defects, if any, exist, and asking for the names and addresses of the quarries and their agents, the size of the blocks available, with prices per cubic foot. Enquiry is also made regarding mode of delivery and cost thereof. This is a very circumstantial and business-like enquiry, and should have a very comprehensive answer. The Ontario Bureau of Mines can give valuable aid in filling the requisition, and the Ottawa publications of the Geological Survey. We would suggest correspondence with the Nova Scotia Department of Mines, or with the Crown Lands Department of Quebec. These provinces are both nearer the source of the enquiry. At the present time, so far as known, only two marble quarries are being worked in Ontario, both in the neighbourhood of Renfrew. There are, however, several unworked quarries in different sections, while in Algoma there is said to be marble of an excellent quality. According to Prof. Carter, the reason so few of these quarries are being worked lies in the demand for Tennessee marble, which has gained quite a market in Canada, though in many respects Ontario marbles are just as good. All the interior marble used in the Parliament Buildings, at Ottawa, is Renfrew stone. There is but little doubt that nearly all the marble quarries in Ontario could be easily and cheaply worked, and there seems no good reason why a strong demand should not be created for their products.

Messrs. Arnoldi & Ewart and Messrs. Band, Burritt & Meredith, architects, of Ottawa, have entered into partnership to carry on business in Ottawa, Toronto and Winnipeg under the name of "The Architectural and Engineering Co."

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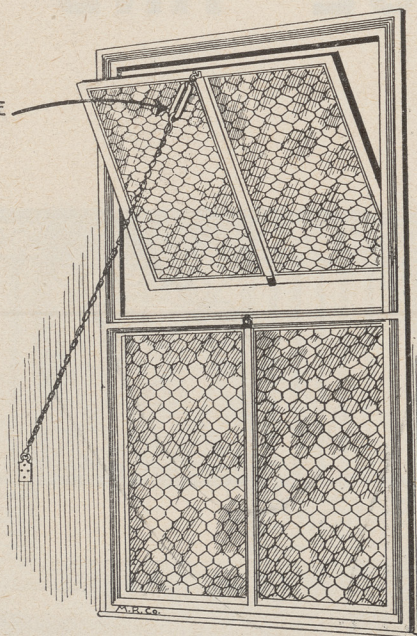
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By CYRUS JOHNSON.

The local or traveling representative has always seemed to me the real life and blood advertisement of the firm he represents, and no personal letter, printed circular, blotter, calender or souvenir can take his place.

I speak from experience as a draughtsman, architect and publisher, on personal acquaintance with many of the leading manufacturers and architects of the United States and the publishers of nearly all the architectural magazines and trade papers.

But letters, circulars and advertising literature are necessarily accompaniments to these representatives and it is in regard to this part of publicity that my statements will be confined.

An architect has ever been a different business proposition from any other man in any other profession, trade or walk in life.

He may be led to the trough, but you cannot make him drink.

He may be reasoned with, but never forced to any conclusion.

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What was law and gospel in the office where he traced his way to fame is good enough for his own office.

But it is needless to elaborate his distinguishing characteristics, only they must be considered in the preparation of catalogues, price lists, announcements or printed matter of any character.

An announcement that would appeal to a banker or broker would fall very flat to the average architect.

In regard to printed matter of any kind unless attractively compiled, printed on good stock and the

illustrations carefully selected, well engraved and properly printed, your money has been wasted.

And this brings me to the importance of having your announcements in the architectural magazines attractively set. These advertisements are only circulars or announcements mailed every issue to the subscribers among the architects, but they are watched even more carefully than you even imagine.

Because the architectural magazine advertisements do not bring the statement, "I saw your ad in the ———," do not infer that your money is being thrown away. It is one of the peculiarities of the architect that he would not mention the name of the publication.

This is true also of the contractor and smaller supply houses, who even avoid the use of the key.

But it is the persistency of circulars, announcements and advertisements, backed by attractive arrangement, that counts. The draughtsman of to-day is the architect and engineer of to-morrow. You must cast your bread on the water of the present for the business of the future.

It always seemed strange to me that knowing the architect's fondness for pictures that they are not more liberally used in your announcements and that the bare cards are allowed to run month after month, year after year in the different journals without change. The publisher is anxious to improve the appearance of his paper and gladly welcomes the new life and interest evidenced by attractive advertising copy. The architectural paper by its news items and articles keeps you posted as to what the best men are doing.

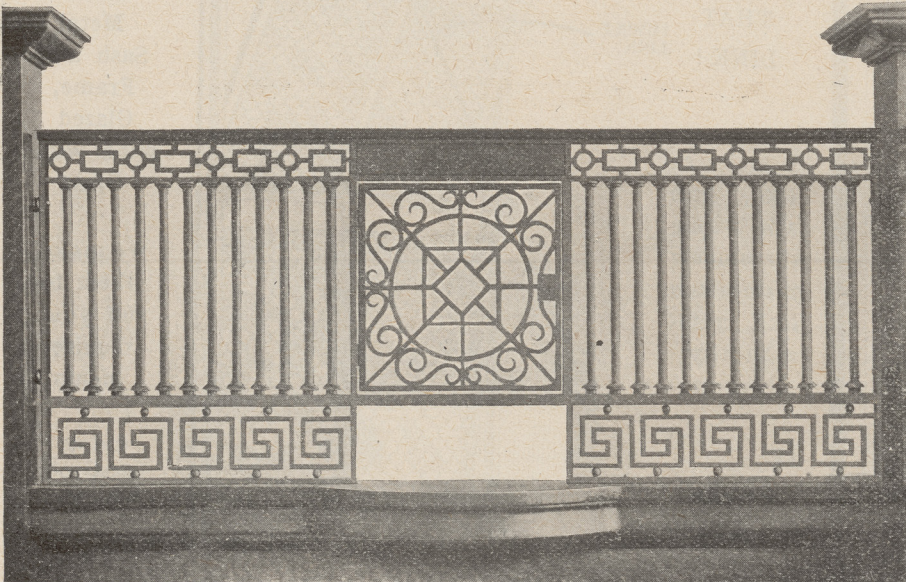
The architects watch it and read it to see what the other fellow is doing.

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